# Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site Kalamazoo, Michigan

# Final Technical Memorandum 14 Biota Investigation

# Appendix D QA/QC Review of Data Summary of Precision and Accuracy Assessment

January 2002

*Technical Memorandum*

# APPENDIX D

*QA/QC Review of Data - Summary of Precision and Accuracy Assessment*

Data packages for biota and soil sample PCB, Pesticide and Mercury analyses were reviewed and inspected for analytical precision and accuracy. Three sample delivery groups (SDGs) containing TBSA soils, one SDG containing earthworms, one SDG containing deer mice, one SDG containing snapping turtles, and 22 SDGs containing fish were reviewed and evaluated.

Analytical precision was assessed by comparing the relative percent differences (RPDs) between percent recoveries for the matrix spike (MS) and matrix spike duplicate (MSD) samples. In addition, RPDs were calculated for soil field duplicates.

Matrix spike recovery and other indicators of accuracy, such as surrogate spike and blank spike recoveries, were examined to assess the analytical method's accuracy.

An overall precision and accuracy summary, as assessed through the review of QA/QC information including MS/MSD recoveries and RPDs between recoveries, matrix spike blank (MSB) recoveries, surrogate spike recoveries and contamination levels in the blanks, is presented below.

## *1. Precision and Accuracy Assessment for PCB Analyses*

Data packages for the TBSA soil, terrestrial biota, and aquatic biota sample PCB analyses were reviewed and inspected for analytical precision and accuracy. Three SDGs, designated as 40734, 40738 and 40869, containing the TBSA soil samples; one SDG, designated as 39990, containing the earthworm samples; one SDG, designated as A4D260034, containing deer mice samples; one SDG, designated as 39058, containing the turtle samples; eight SDGs, designated as 39026, 39178, 39563, 39962, 40009, 40191, 42788* and 42799*, containing the bass samples; eight SDGs, designated as 39023, 39060, 39560, 39955, 40202, 40139, 42788* and 42799*, containing the carp samples; and eight SDGs, designated as 39029, 39101, 39566, 39963, 39976, 40118, 40193 and 40219, containing the sucker samples were reviewed and evaluated. (Note: SDGs designated "*" contained both bass and carp samples.)

### 1.1 TBSA Phase II - Soil PCB Data Quality Summary

All MS/MSD recoveries and relative percent between recoveries were within acceptable control limits. Recovery of Aroclor 1242 in the MS/MSD associated with SDG# 40734 could not be calculated due to interference from Aroclor 1248 in the unspiked sample.

Matrix spike recoveries for Aroclor 1242 ranged from 47 to 51 percent with an average of 49.0 percent, while recoveries of Aroclor 1254 ranged from 40 to 93 percent with an average of 69.5 percent. The precision of the matrix spikes as measured by the RPD between the MS and MSD recoveries ranged from 15 to 48 percent with an average of 31.5 percent for Aroclor 1254. The RPD for Aroclor 1242 was 8. Blank spike recoveries of Aroclor 1242 ranged from 39 to 82 percent with an average of 60.5 percent. Recoveries of Aroclor 1254 ranged from 66 to 94 percent with an average of 80.0 percent.

No Aroclors were detected in the field duplicate samples.

Surrogate recoveries of tetrachloro-meta-xylene (TCMX) were below acceptable control limits for 13 of 33 samples analyzed. Recoveries of decachlorobiphenyl (DCB) were, however, within acceptable limits for all but one sample. Recoveries of both TCMX and DCB were above acceptable control limits in one sample K12022. All positive data for this

sample have been qualified as estimated based on the recoveries. Overall, recoveries for TCMX ranged from 4 to 158 percent with an average of 64.4 percent. Recoveries for DCB ranged from 64 to 163 percent with an average of 91.5 percent.

No Aroclors were detected in the method blanks.

### 1.2 Earthworm PCB Data Quality Summary

One MS/MSD sample was analyzed. All recoveries for the MS/MSD were within acceptable control limits. The RPDs between the MS and MSD samples were, however, slightly above the acceptable control limit. Matrix spike recoveries for Aroclor 1242 ranged from 56 to 81 percent with an average of 68.5 percent, while recoveries of Aroclor 1254 ranged from 65 to 97 percent with an average of 81.0 percent. The precision of the matrix spikes as measured by the RPD between the MS and MSD recoveries was 36 for Aroclor 1242 and 40 for Aroclor 1254. Blank spike recoveries of Aroclors 1242 and 1254 were within acceptable control limits with a recovery of 78 percent for Aroclor 1242 and 88 percent for Aroclor 1254.

Surrogate recoveries of TCMX were below acceptable control limits for 8 of 16 samples analyzed. In all but three of these samples, DCB recoveries were within acceptable limits. Surrogate recoveries for both TCMX and DCB were below acceptable control limits in three samples. All data for these three samples have been qualified as estimated based on the recoveries. Overall, recoveries for TCMX ranged from 17 to 89 percent with an average of 59.8 percent. Recoveries of DCB ranged from 26 to 104 percent with an average of 77.5 percent.

No Aroclors were detected in the method blanks.

### 1.3 Deer Mice PCB Data Quality Summary

No deer mice samples were submitted for MS/MSD analyses. All blank spike recoveries, however, were within acceptable control limits with recoveries for Aroclor 1242 ranging from 103 to 107 percent with an average of 106.3 percent and recoveries of Aroclor 1254 ranging from 104 to 112 percent with an average of 107.7 percent.

All surrogate recoveries were within acceptable control limits. Overall, recoveries for TCMX ranged from 76 to 130 percent with an average of 91.9 percent. Recoveries of DCB ranged from 88 to 137 percent with an average of 101.8 percent.

No Aroclors were detected in the method blanks.

### 1.4 Snapping Turtle PCB Data Quality Summary

Matrix spike recoveries for Aroclor 1242 ranged from 114 to 115 percent with an average of 114.5 percent, while recoveries of Aroclor 1254 ranged from 183 to 218 percent with an average of 200.5 percent. The high Aroclor 1254 recoveries can be attributed to positive interference from PCB present in the unspiked sample. The precision of the matrix spikes as measured by the RPD between the MS and MSD recoveries ranged from 1 to 17 with an average of 9.0. Blank spike recoveries were within acceptable control limits with Aroclor 1242 at 98 percent recovery and Aroclor 1254 at 102 percent recovery.

Surrogate recoveries of TCMX and DCB were within acceptable control limits for all samples. Overall, recoveries for TCMX ranged from 62 to 98 percent with an average of 79.1 percent. Recoveries of DCB ranged from 69 to 106 percent with an average of 88.6 percent.

No Aroclors were detected in the method blanks.

### 1.5 Bass PCB Data Quality Summary

Matrix spike recoveries for Aroclor 1242 ranged from 41 to 98 percent with an average of 68.1 percent, while recoveries of Aroclor 1254 ranged from 29 to 78 percent with an average of 60.8 percent. The RPD values for Aroclor 1242 ranged from 6 to 33 percent with an average of 15.4 percent. RPD values for Aroclor 1254 ranged from 0 to 45 percent with an average of 14.3 percent. Blank spike recoveries for Aroclor 1242 ranged from 39 to 90 percent with an average of 66.9 percent. Recoveries for Aroclor 1254 ranged from 41 to 105 percent with an average of 73.0 percent.

Surrogate recoveries of TCMX were below acceptable control limits for 78 of the 191 samples. Recoveries of DCB were, however, within acceptable control limits for all but nine of those samples. Recoveries for both TCMX and DCB were below acceptable control limits in samples K40109F, K40134F, K40135R, K40139F, K40140R, K40244F, K40244R, K40351F and K40351R. All data in these samples have been qualified as estimated based on the recoveries. Overall, recoveries for TCMX ranged from 30 to 102 percent with an average of 65.0 percent. Recoveries for DCB ranged from 38 to 114 percent with an average of 79.5 percent.

No Aroclors were detected in the method blanks.

### 1.6 Carp PCB Data Quality Summary

Recoveries for Aroclor 1242 ranged from 45 to 118 percent with an average of 73.4 percent, while recoveries of Aroclor 1254 ranged from 22 to 93 percent with an average of 66.3 percent. The RPD values for Aroclor 1242 ranged from 2 to 39 percent with an average of 14.2 percent. RPD values for Aroclor 1254 ranged from 6 to 45 percent with an average of 23.2 percent. Blank spike recoveries for Aroclor 1242 ranged from 39 to 92 percent with an average of 74.3 percent, and recoveries for Aroclor 1254 ranged from 41 to 107 percent with an average of 77.6 percent.

Surrogate recoveries of TCMX were outside acceptable control limits for 63 of the 177 samples. DCB recoveries were, however, within acceptable control limits for all but 5 of these samples. Recoveries of both TCMX and DCB were below control limits in samples K40119F, K40120F, K40350R and K40423R. All data in these samples have been qualified as estimated based on the recoveries. In addition, recoveries of both surrogates were above control limits in sample K40319F. All positive data for this sample were qualified as estimated. Overall, recoveries for TCMX ranged from 34 to 176 percent with an average of 67.0 percent. Recoveries of DCB ranged from 47 to 217 percent with an average of 89.4 percent.

Low levels of Aroclors 1016 and 1242 were detected in method blanks PBLKAP and PBLKAH of SDG# 39023. Neither of these Aroclors were detected in the samples associated with these blanks, therefore, no qualifiers were added to the samples. No Aroclors were detected in the remaining method blanks.

### 1.7 Sucker Sample PCB Data Quality Summary

All MS/MSD recoveries and relative percent differences between recoveries were within acceptable control limits. All blank spike recoveries were also within acceptable control limits.

Matrix spike recoveries for Aroclor 1242 ranged from 60 to 120 percent with an average of 87.0 percent, while recoveries of Aroclor 1254 ranged from 43 to 94 percent with an average of 79.8 percent. The RPD values for Aroclor 1242 ranged from 0 to 17 percent with an average of 6.5 percent. RPD values for Aroclor 1254 ranged from 1 to 24 percent with an average of 8.3 percent. Blank spike recoveries for Aroclor 1242 ranged from 65 to 115 percent with an average of 88.6 percent, and recoveries for Aroclor 1254 ranged from 82 to

105 percent with an average of 92.5 percent.

Surrogate recoveries of TCMX were below acceptable control limits for 29 of the 164 samples. Recoveries for DCB were within acceptable control limits for all but eight of the samples. Recoveries of both TCMX and DCB were below control limits in samples K40058W, K40060W, K40223W, K40228W, K40291W, K40292W, K40434W and K40435W. All data for these samples have been qualified as estimated based ont the recoveries. Overall, surrogate recoveries for TCMX ranged from 41 to 101 percent with an average of 74.8 percent. Recoveries of DCB ranged from 48 to 114 percent with an average of 87.1 percent.

No Aroclors were detected in the method blanks.

*2. Precision and Accuracy Assessment for Pesticides*

Data packages for fish sample Pesticide analyses were reviewed and inspected for analytical precision and accuracy. Eight SDGs, designated as 39026, 39178, 39563, 39962, 40009, 40191, 42788* and 42799*, containing the bass samples; eight SDGs, designated as 39023, 39060, 39560, 39955, 40202, 40139, 42788* and 42799*, containing the carp samples; and eight SDGs, designated as 39029, 39101, 39566, 39963, 39976, 40118, 40193 and 40219, containing the sucker samples were reviewed and evaluated. (Note: SDGs designated "*" contained both bass and carp samples.)

**2.1 Bass Pesticide Data Quality Summary**

Matrix spike recoveries ranged from 48 to 353 percent with an average of 130.9 percent. Blank spike recoveries ranged from 41 to 356 percent with an average of 87.7 percent. Elevated recoveries were observed for several pesticides, particularly Aldrin, which can be attributed to positive interference from PCB present in the matrix spiking solution. The RPD values ranged from 2 to 43 percent with an average of 10.0 percent.

Surrogate recoveries of TCMX were below acceptable control limits for 22 of the 210 samples. Recoveries of DCB were also below acceptable control limits in 23 samples. Recoveries of both TCMX and DCB were below control limits in samples K40048F, K40071F, K40072F, K40073F, K40106F, K40109F, K40134F, K40239F, K40239R and K40244R. All data in these samples have been qualified as estimated based on the recoveries. Overall, surrogate recoveries for TCMX ranged from 30 to 103 percent with an average of 71.5 percent. Recoveries of DCB ranged from 31 to 112 percent with an average of 77.0 percent.

No pesticides were detected in the method blanks.

**2.2 Carp Pesticide Data Quality Summary**

Matrix spike recoveries ranged from 65 to 493 percent with an average of 155.6 percent. Elevated recoveries were observed for several pesticides, particularly Aldrin, which can be attributed to positive interference from PCB present in the matrix spiking solution. The RPD values ranged from 0 to 59 percent with an average of 14.5 percent. Blank spike recoveries ranged from 41 to 133 percent with an average of 90.3 percent.

Surrogate recoveries of TCMX were within acceptable control limits for all but 13 of the 236 samples. Recoveries of DCB were also within acceptable control limits for all but 13 of the samples analyzed. Recoveries for both TCMX and DCB were outside control limits in samples K40119F, K40120F, K40270F, K40272F, K40320F, K40321F, K40322F, K40423F and K40423R. All data in these samples have been qualified as estimated based on the recoveries. Overall, surrogate recoveries for TCMX ranged from 44 to 211 percent with an average of 83.8 percent. Recoveries of DCB ranged from 43 to 185 percent with an average of 86.4 percent.

No Aroclors were detected in the method blanks.

### 2.3 Sucker Pesticide Data Quality Summary

Matrix spike recoveries ranged from 65 to 386 percent with an average of 154.7 percent. Elevated recoveries were observed for several pesticides, particularly Aldrin, which can be attributed to positive interference from PCB present in the matrix spiking solution. The RPD values ranged from 0 to 23 percent with an average of 4.3 percent. Blank spike recoveries ranged from 81 to 131 percent with an average of 108.0 percent.

Surrogate recoveries of TCMX were within acceptable control limits for all but 31 of the 159 samples. Recoveries of DCB were within acceptable control limits for all but 23 of the samples analyzed. Recoveries of both TCMX and DCB were below acceptable control limits in samples K40023W, K40057W, K40058W, K40060W, K40061W, K40062W, K40063W, K40217W, K40219W, K40220W, K40221W, K40222Wm K40223W, K40224W, K40225W, K40226W, K40228W, K40291W, K40433W, K40434W and K40435WR. All data for these samples were qualified as estimated based on the recoveries. Overall, recoveries for TCMX ranged from 15 to 147 percent with an average of 80.1 percent. Recoveries of DCB ranged from 15 to 152 percent with an average of 85.7 percent.

No Aroclors were detected in the method blanks.

## 3. *Precision and Accuracy Assessment for Mercury Analyses*

Data packages for the fish sample Mercury analyses were reviewed and inspected for analytical precision and accuracy. Eight SDGs, designated as 39026, 39178, 39563, 39962, 40009, 40191, 42788* and 42799*, containing the bass samples; eight SDGs, designated as 39023, 39060, 39560, 39955, 40202, 40139, 42788* and 42799*, containing the carp samples; and eight SDGs, designated as 39029, 39101, 39566, 39963, 39976, 40118, 40193 and 40219, containing the sucker samples were reviewed and evaluated. (Note: SDGs designated "*" contained both bass and carp samples.)

### 3.1 Bass Mercury Data Quality Summary

Recoveries for all matrix spikes, with the exception of those in SDGs 39026, 39563, 39962, 40009, 40191 and 42799, were within acceptable control limits. Mercury data for all samples in these SDGs have been qualified as estimated based on the recoveries. Overall, spike recoveries ranged from 20.6 to 88.9 percent with an average of 63.3 percent.

All laboratory duplicate RPD values were within acceptable control limits with the exception of those in SDGs 39962 and 40191. No qualifiers have been added to the data based on the RPDs. Overall, RPD values ranged from 0.4 to 35.9 percent with an average of 13.4 percent.

All laboratory control sample (LCS) percent recoveries were within acceptable control limits.

All calibration and preparation blanks were found to be acceptable with no target analytes detected above the contract required detection limit (CRDL).

### 3.2 Carp Sample Mercury Data Quality Summary

All matrix spike recoveries, with the exception of those in SDGs 39955, 40202 and 42799, were within acceptable control limits. Mercury data for all samples in these SDGs have been qualified as estimated based on the recoveries. Overall, spike recoveries ranged from 33.5 to 186.7 percent with an average of 100.4 percent.

All laboratory duplicate RPD values were within acceptable control limits with the exception of that in SDG# 40799. No qualifiers have been added to the data based on the RPD. Overall, RPD values ranged from 7.8 to 178.8 percent with an average of 31.0 percent.

All LCS percent recoveries were within acceptable control limits.

All calibration and preparation blanks were found to be acceptable with no target analytes detected above the CRDL.

### 3.3 Sucker Sample Mercury Data Quality Summary

All matrix spike recoveries, with the exception of those in SDGs 39029 and 39101, were within acceptable control limits. Mercury data for all samples in these SDGs have been qualified as estimated based on the recoveries. Overall, spike recoveries ranged from 62.6 to 90.8 percent with an average of 79.6 percent.

The difference between laboratory duplicates were all within acceptable control limits.

All LCS percent recoveries were within acceptable control limits.

All calibration and preparation blanks were found to be acceptable with no target analytes detected above the CRDL.

# Appendix D

**QA/QC Review of Data - Summary of Precision and Accuracy Assessment**
**Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site**

Data packages for eight sample delivery groups (SDGs), designated FISH01, FISH02, FISH03, FISH04. FISH05, FISH06, FISH07 and FISH08, containing biota sample data for PCBs were reviewed and evaluated for analytical precision and accuracy. It should be noted that some SDGs included whole-body composite samples. Since the SDGs were analyzed and reported as a group, the QA/QC review of the results also addressed the entire SDG. Therefore, although not presented in the Technical Memorandum Addendum, the whole-body composite sample results are included in the following summary, as well as the laboratory data sheets provided in Appendix E of this document.

Analytical precision for biota samples was assessed by comparing the relative percent differences (RPDs) between percent recoveries for the matrix spike (MS) and matrix spike duplicate (MSD) samples.

Matrix spike recovery and other indicators of accuracy, such as surrogate spike and laboratory control sample (LCS) recoveries, were examined to assess the analytical method's accuracy for all matrixes.

An overall precision and accuracy summary, as assessed through the review of QA/QC information including MS and MSD recoveries, RPD values for MS/MSD recoveries, surrogate spike recoveries, laboratory control sample (LCS) recoveries and blank performance, is present below. A more detailed analysis of data quality can be found in the Laboratory Data Review Reports (Appendix E).

1. Data Quality Assessment for Bass Analyses

   Seven data packages containing bass samples were reviewed and inspected for analytical precision and accuracy.

   1.1 Bass Fillet PCB Data Quality Summary

   Bass fillet data from the 1997 sampling event showed no pervasive bias as demonstrated by surrogate. LCS and MS recoveries. Surrogate recoveries of the samples, MS/MSDs, LCSs and method blanks were consistent, indicative of minimal matrix effect on data accuracy. All LCS and matrix spike recoveries were within control limits. With two exceptions, all surrogate recoveries were also within control limits.

   - MS/MSD recoveries for Aroclor 1242 ranged from 109 to 123 percent with an average of 116 percent while recoveries for Aroclor 1254 ranged from 107 to 120 percent with an average of 114 percent. RPD values ranged from 11 to 12 with an average of 12 percent.

   - LCS recoveries were within acceptable limits with recoveries for Aroclor 1242 ranging from 97 to 172 percent with an average of 120 percent and recoveries for Aroclor 1254 ranging from 91 to 142 percent with an average of 115 percent.

   - Surrogate recoveries were within control limits for all but two samples. Tetrachloro-meta-xylene (TCX) recoveries ranged from 57 to 152 percent with an average of 84 percent and decachlorobiphenyl recoveries ranged from 55 to 150 percent with an average of 87 percent. Recoveries for both surrogates were slightly below control limits in sample K40617, indicating a potential low bias to the

- LCS recoveries were within acceptable limits with recoveries for Aroclor 1242 ranging from 97 to 172 percent with an average of 123 percent and recoveries for Aroclor 1254 ranging from 91 to 143 percent with an average of 118 percent.

- Surrogate recoveries were within control limits for all but eight samples. Tetrachloro-meta-xylene (TCX) recoveries ranged from 37 to 135 percent with a mean value of 76 percent and decachlorobiphenyl recoveries ranged from 70 to 144 percent with a mean value of 95 percent. Recoveries for one surrogate was below control limits in samples K40506, K40512, K50415, K40587, K40640, K40641, K40643 and K40645. Since recoveries for the remaining surrogate were within control limits, the deviations should have little or no impact on the sample data.

- No Aroclors were detected in the method blanks.

- All initial calibration and continuing calibration standards were within method-specified limits.

# APPENDIX A

## PCDD/PCDF Precision and Accuracy Summary

Data packages for the PCDD/PCDF fish and turtle sample analyses were reviewed and checked for analytical precision and accuracy. One SDG, designated TLI28462, containing the fish samples and one SDG, designated TLI30206, containing the turtle samples were reviewed and evaluated.

Laboratory analytical precision was assessed by examining the percent relative standard deviation (RSD) of the initial calibration standards and by comparing the analytical results between matrix spikes and matrix spike duplicate samples.

In addition to the matrix spike data, indicators of accuracy such as internal standard and surrogate standard recovery data were examined to assess the method accuracy.

### A.1 Fish Sample PCDD/PCDF Data Quality Summary

All initial calibration RSDs were within acceptable limits. The RSDs for unlabeled (target) compounds ranged from 1 to 16 percent with an average of 5 percent. The RSDs for labeled compounds (surrogates and internal standards) ranged from 1 to 14 percent with an average of 5 percent.

No matrix spikes were analyzed with the fish samples; therefore, no assessment of matrix-specific accuracy or precision could be made.

Nine labeled PCDD/PCDF congeners are used as internal standards. The standards are added at the extraction step and function to quantify the analyte present in the sample as well as determine overall method efficiency. All internal standard recoveries were within acceptable control limits with recoveries ranging from 28 to 128 percent with an average recovery of 75 percent.

Five labeled PCDD/PCDF congeners are used as surrogate standards and two labeled HxCDFs are used as alternate standards. These standards are added at the cleanup step and are used to evaluate the method fractionation efficiencies separately from the extraction efficiencies. All surrogate recoveries, with the exception of 1,2,3,4,7,8,9-HpCDF which was slightly high in sample K40361F, were within acceptable control limits. Recoveries ranged from 43 to 140 percent with an average of 87 percent.

No target compounds were detected in the method blanks.

### A.2 Turtle Sample PCDD/PCDF Data Quality Summary

All initial calibration RSDs were within acceptable limits. The RSDs for unlabeled (target) compounds ranged from 4 to 14 percent with an average of 8 percent. The RSDs for labeled compounds (surrogates and internal standards) ranged from 2 to 20 percent with an average of 7 percent.

All MS/MSD recoveries were within acceptable limits. Recoveries ranged from 99 to 128 percent with an average recovery of 113 percent. The precision of the matrix spikes as measured by the RPD between the MS and MSD recoveries ranged from 0 to 6.8 with an average RPD of 3.

Nine labeled PCDD/PCDF congeners are used as internal standards. The standards are added at the extraction step and function to quantify the analyte present in the sample as well as determine overall method efficiency. Internal standard recoveries were below acceptable control limits for 6 standards in sample K42033. All PCDD/PCDF data for this sample have been qualified as estimated. Recoveries for all remaining internal standards were within acceptable limits. Overall, internal standard recoveries ranged from 25 to 86 percent with an average recovery of 59 percent.

Five labeled PCDD/PCDF congeners are used as surrogate standards and two labeled HxCDFs are used as alternate standards. These standards are added at the cleanup step and are used to evaluate the method fractionation efficiencies separately from the extraction efficiencies. Recoveries were below acceptable control limits for 3 surrogates in sample K42033. All PCDD/PCDF data for this sample have been qualified as estimated based on the recoveries. Surrogate recoveries for the remaining samples were within acceptable control limits. Overall, surrogate recoveries ranged from 28 to 103 percent with an average of 68 percent.

1,2,3,4,6,7,8,9-OCDD and 2,3,4,6,7,8-HxCDF were found in the method blank. These compounds were detected in the associated samples K42001, K42022 and K42033 at levels less than 5 times the method blank and were qualified as non-detected. 1,2,3,4,6,7,8-HpCDD was also detected in the method blank. This compound was detected in the associated samples K42022 and K42033 at levels less than 5 times the tissue method blank and were qualified as non-detected. The compound was detected in sample K42001 at a level greater than 5 times the method blank. The presence of 1,2,3,4,6,7,8-HpCDD in this sample is therefore deemed to be site-related. ~~SDG, designated TLI30206, containing the turtle samples were~~

# APPENDIX B

# DATA QUALITY REVIEW REPORTS

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

POLYCHLORINATED DIBENZO-p-DIOXINS
AND DIBENZOFURANS ANALYSES

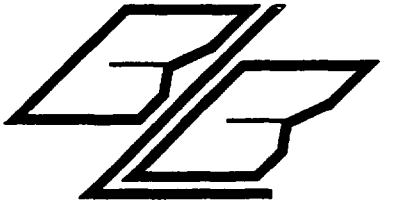
BIOTA - FISH

TLI PROJECT# 28462

Analyses performed by:

Triangle Laboratories of RTP, Inc.
Durham, North Carolina

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

## Summary

The following is an assessment of the data package for TLI PROJECT# 28462 for the biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following sample:

| Sample ID | Lab ID | Matrix | Sample Date | Extraction Date | Analysis Date |
|---|---|---|---|---|---|
| P40406F | 83-100-1 | carp | 11/9/93 | 7/6/94 | 7/16/94 |
| K40280F | 83-100-2 | bass | 10/12/93 | 7/6/94 | 7/16/94 |
| K40286F | 83-100-3 | carp | 10/13/93 | 7/6/94 | 7/16/94 |
| K40135F | 83-100-4 | bass | 9/17/93 | 7/6/94 | 7/16/94 |
| K40188F | 83-100-5 | carp | 10/7/93 | 7/6/94 | 7/16/94 |
| K40258F | 83-100-6 | bass | 10/12/93 | 7/6/94 | 7/16/94 |
| K40113F | 83-100-7 | bass | 9/2/93 | 7/6/94 | 7/16/94 |
| K40253F | 83-100-8 | bass | 10/12/93 | 7/6/94 | 7/16/94 |
| K40241F | 83-100-9 | bass | 10/11/93 | 7/6/94 | 7/16/94 |
| K40190F | 83-100-10 | bass | 10/7/93 | 7/6/94 | 7/16/94 |
| K40305F | 83-100-11 | bass | 10/13/93 | 7/6/94 | 7/16/94 |
| K40321F | 83-100-12 | carp | 10/13/93 | 7/6/94 | 7/16/94 |
| K40361F | 83-100-13 | carp | 10/15/93 | 7/6/94 | 7/14/94 |
| K40164F | 83-100-14 | bass | 9/22/93 | 7/6/94 | 7/14/94 |
| K40123F | 83-100-15 | carp | 9/17/93 | 7/6/94 | 7/14/94 |
| K40154F | 83-100-16 | carp | 9/22/93 | 7/6/94 | 7/14/94 |
| K40026F | 83-100-17 | bass | 8/25/93 | 7/6/94 | 7/14/94 |
| K40045F | 83-100-18 | bass | 8/27/93 | 7/6/94 | 7/14/94 |
| K40009F | 83-100-19 | carp | 8/25/93 | 7/6/94 | 7/14/94 |
| K40353F | 83-100-20 | bass | 10/15/93 | 7/6/94 | 7/14/94 |
| K40036F | 83-100-21 | carp | 8/27/93 | 7/6/94 | 7/14/94 |
| K40095F | 83-100-22 | carp | 9/2/93 | 7/6/94 | 7/14/94 |
| K40431F | 83-100-23 | carp | 11/9/93 | 7/6/94 | 7/15/94 |

## Introduction

Analyses were performed according to the USEPA Method 8290, Rev.0 - 11/90.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

Concentration qualifiers:

ND The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

EMPC The "estimated maximum possible concentration" is reported when GC/MS signals eluting within the established retention time window have a signal-to-noise ratio in excess of 2.5 but do not meet the ion abundance ratio criteria.

Quantitation qualifiers:

B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

S The compound has exceeded the normal dynamic range.

I The labeled compound may be falsely elevated due to coeluting peak(s).

Q The reported concentrations and percent recoveries may be over or under estimated due to a quantitative interference.

N The $^{13}C$-labeled internal standard has a S/N ratio of less than 10:1.

V The analytical results are considered valid even though the internal standard recoveries are below the QC limit.

RO The ion abundance ratios of the internal standards are outside of the acceptable range.

PR The reported concentration may be underestimated due to a poorly resolved GC peak.

U The reported concentration may be underestimated due to the presence of a large closely eluting peak.

E A PCDF peak elutes at the same time as the associated diphenyl ether (DPE) and the DPE peak intensity is ten percent or more of the PCDF peak intensity. The reported concentration may be overestimated due to DPE contribution to the peak area.

Validation qualifiers:

J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

1. Holding Time

The method recommended holding time for extraction of fish samples is 30 days from sample collection. PCDDs and PCDFs are very stable in a variety of matrices and holding times may be as high as a year or more when samples are maintained under proper conditions. Samples must, however, be analyzed within 45 days of extraction. No deviations from these holding time requirements were noted.

2. Blank Contamination

Quality assurance blanks (i.e., method, field, or rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross contamination of samples during field operations.

No target compounds were detected in the method blanks. Field and rinse blanks are applicable to biota sampling.

3. Mass Spectrometer Resolution Check

Mass spectrometer resolution performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The % relative standard deviation (%RSD) was less than 20% for all non-labeled compounds (targets) and less than 30% for all labeled compounds (surrogates and internals). All isotope abundance ratios were within the defined limits.

4.2 Continuing Calibration

Continuing calibration target standards were within the 20% difference (%D) of the initial calibration. All isotope abundance ratios were within the defined limits.

5. Internal Standard Performance and Recovery

All samples to be analyzed for PCDD/PCDF compounds are spiked with the internal standard mix prior to extraction, which eliminates the need to correct quantitative data for extraction efficiency. Internal standard recoveries, isotope abundance ratios and retention times were within acceptable limits. Internal standard $^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF experienced quantitative interference in samples K40280F, K40286F, K40188F, K40258F, K40241F, K40123F, K40154F, K40026F, K40045F and K40353F. Internal standard $^{13}C_{12}$-1,2,3,7,8-PeCDD experienced quantitative interference in sample K40241F. All positive data associated with these internal standards have been qualified as estimated.

6. Surrogate/Alternate Standard Compound Recovery

All samples to be analyzed for PCDD/PCDF compounds are spiked with surrogate and alternate standards after extraction but prior to sample cleanup procedures. These standards are used to monitor the efficiency of the cleanup procedures.

All alternate standard recoveries, isotope abundance ratios, and retention times were within acceptable limits. All surrogate recoveries, with the exception of $^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF which was above the acceptable control limit in sample K40361F, were within acceptable control limits. All positive HpCDF data in sample K40361F have been qualified as estimated based on the recovery.

7. Recovery Standard Performance

All samples to be analyzed for PCDD/PCDF compounds are spiked with recovery standard prior to injection. The concentrations of all the labeled standards (internal, surrogate and alternate) are determined by using the recovery standard. All recovery standard isotope abundance ratios and retention times were within acceptable limits.

8. Compound Identification

PCDD/PCDF compounds are identified on the HRGC/HRMS by using the analyte's ion abundance ratios and retention times. The ion abundance ratios must be within 15% of theoretical values, have a signal to noise ratio (S/N) of greater than 2.5, and the ions must maximize within two seconds of each other. The retention time for the analyte must be within -1 to +3 seconds of the corresponding $^{13}C$-labeled standard. All positively identified compounds met the specified criteria.

Due to incomplete peak resolution on the DB-5 column, the presence of 2,3,7,8-TCDF must be confirmed on a secondary column. All samples in which 2,3,7,8-TCDF have been tentatively identified are analyzed on a second column which completely resolves the isomer peak. Data from the second column is used for identification and quantitation of 2,3,7,8-TCDF.

An EMPC or "estimated maximum possible concentration" designation is given to compounds which have signals eluting within the established retention time window which would, if positively identified, be above the detection limit. The signals do not, however, meet the ion abundance ratio criteria and cannot be identified as the compound of interest. The EMPC value is the estimated concentration of the interferant quantitated "as" the compound of interest. This value should be considered an elevated detection limit based on potential compound identification and quantitation interference.

9. Matrix Spike/Matrix Spike Duplicate Samples

Method 8290 employs isotope-dilution mass spectrometry which not only provides highly accurate quantitation but also serves to correct for analytical or matrix bias. The method, therefore, does not require the analysis of matrix spikes. Although not required by the method, matrix spike and matrix spike duplicates can be analyzed to provide an additional assessment of the precision and accuracy of the analytical method.

No matrix spike analyses were performed on the samples.

10. Field Duplicates

Since each sample is unique, field duplicates are not applicable to biota sampling.

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

# Data Validation Checksheets

PCDD/PCDF Data Validation Checklist

| | YES | NO | NA |
|---|---|---|---|
| **Data Completeness and Deliverables** | | | |
| Is there a narrative or cover letter present? | X | | |
| Are the samples numbers included in the narrative? | X | | |
| Are the sample chain-of-custodies present? | X | | |
| Do the chain-of-custodies indicate any problems with sample receipt or sample condition? | | X | |
| **Holding Times** | | | |
| Have any holding times been exceeded? | | X | |
| **Internal Standard Performance** | | | |
| Was internal standard data submitted? | X | | |
| Was one or more internal standard recovery outside of specified limits for any sample or blank? | | X | |
| If yes, were the samples reanalyzed? | | | X |
| Was one or more ion abundance ratio or retention time outside of specified limits? | | X | |
| **Surrogate Standard Performance** | | | |
| Was surrogate recovery data submitted? | X | | |
| Was one or more surrogate recovery outside of specified limits for any sample or blank? | X | | |
| If yes, were the samples reanalyzed? | | X | |
| Was one or more ion abundance ratio or retention time outside of specified limits? | | X | |
| **Matrix Spikes** | | | |
| Is there matrix spike recovery data submitted? | | X | |
| Were matrix spikes analyzed at the required frequency? | | | X |
| Were any spike recoveries outside of QC limits? | | | X |
| **Blanks** | | | |
| Is the method blank data submitted? | X | | |
| Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Has a blank been analyzed at least once every twelve hours for each system used? | X | | |
| Is the chromatographic performance acceptable for each instrument? | X | | |
| Do any method/reagent/instrument blanks have positive results? | | X | |
| Do any trip/field/rinse blanks have positive results? | | | X |
| Are there field/rinse/equipment blanks associated with every sample? | | X | |
| **Mass Spectrometer Resolution** | | | |
| Are the GC/MS resolution check data submitted? | X | | |
| Was a resolution of 10000 met for each instrument? | X | | |
| **Target Analytes** | | | |
| Is a PCDD/PCDF analysis results sheet present for each of the following: | | | |
| Samples | X | | |
| Matrix spikes | | | X |
| Blanks | X | | |
| Are the selected ion chromatograms present for each of the following: | | | |
| Samples | X | | |
| Matrix spikes | | | X |
| Blanks | X | | |
| Is the chromatographic performance acceptable with respect to: | | | |
| Baseline stability | X | | |
| Resolution | X | | |
| Peak shape | X | | |
| **Quantitation and Detection Limits** | | | |
| Are the reporting limits adjusted to reflect sample dilutions and for soils, sample moisture? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| **Standard Data** | | | |
| Are the quantitation reports and selected ion chromatograms present for the initial and continuing calibration standards? | X | | |
| **Initial Calibration** | | | |
| Was the initial calibration data submitted for each instrument used? | X | | |
| Are the response factor RSDs within specified limits? | X | | |
| Were the ion abundance ratios within ±15% of theoretical? | X | | |
| Was the signal-to-noise ratio ≥ 10:1 for every ion current profile? | X | | |
| **Continuing Calibration** | | | |
| Was the continuing calibration data submitted for each instrument? | X | | |
| Has a continuing calibration standard been analyzed for each twelve hours of analysis per instrument? | X | | |
| All %D within acceptable limits? | X | | |
| Were the ion abundance ratios within ±15% of theoretical? | X | | |
| Was the signal-to-noise ratio ≥ 10:1 for every ion current profile? | X | | |
| **Field Duplicates** | | | |
| Where field duplicates submitted with the samples? | | X | |

Corrected Sample Analysis Data Sheets

TL-RTP Project: 28462B
Client Sample: K40009F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943200

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-19 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943195 |
| Sample Size: | 25.030 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | BB | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.77 | | | 0.85 | 25:13 | |
| 1,2,3,7,8-PeCDD | 1.00 | | | 1.33 | 29:37 | |
| 1,2,3,4,7,8-HxCDD | 0.81 | | | 1.14 | 32:49 | |
| 1,2,3,6,7,8-HxCDD | 2.6 | | | 1.14 | 32:53 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8-HpCDD | 3.6 | | | 1.03 | 36:03 | |
| 1,2,3,4,6,7,8,9-OCDD | 2.9 | | | 0.81 | 39:30 | |
| 2,3,7,8-TCDF | 1.6 ~~1.4~~ | | | 0.79 | 24:29 | |
| 1,2,3,7,8-PeCDF | ND | 0.1 | | | | |
| 2,3,4,7,8-PeCDF | EMPC | | 0.89 | | | |
| 3,4,7,8-HxCDF | 0.39 | | | 1.34 | 32:06 | |
| 3,6,7,8-HxCDF | EMPC | | 0.45 | | | |
| 4,6,7,8-HxCDF | EMPC | | 0.28 | | | |
| 1,2,3,7,8,9-HxCDF | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 0.71 | | | 0.97 | 35:04 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.5 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.3 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 0.77 | 1 | | | |
| Total PeCDD | 1.00 | 1 | | | |
| Total HxCDD | 3.6 | 2 | | 4.1 | |
| Total HpCDD | 3.6 | 1 | | | |
| Total TCDF | 3.6 | 3 | | 4.0 | |
| Total PeCDF | EMPC | | | 2.4 | E |
| Total HxCDF | 0.90 | 2 | | 1.7 | |
| Total HpCDF | 0.92 | 1 | | | |

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Printed: 22:05 07/20/94

TL-RTP Project: 28462B
Client Sample: K40026F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943189

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-17 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943176 |
| Sample Size: | 25.080 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | JW | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.6 | | | | — |
| 1,2,3,7,8-PeCDD | ND | 0.9 | | | | — |
| 1,2,3,4,7,8-HxCDD | ND | 0.8 | | | | — |
| 1,2,3,6,7,8-HxCDD | ND | 0.7 | | | | — |
| 1,2,3,7,8,9-HxCDD | ND | 0.8 | | | | — |
| 1,2,3,4,6,7,8-HpCDD | ND | 1.0 | | | | — |
| 1,2,3,4,6,7,8,9-OCDD | EMPC | | 1.8 | | | — |
| 2,3,7,8-TCDF | 1.5 ~~1.8~~ | | | 0.88 | 24:22 | PR |
| 1,2,3,7,8-PeCDF | ND | 0.5 | | | | — |
| 2,3,4,7,8-PeCDF | ND | 0.5 | | | | — |
| 1,2,3,4,7,8-HxCDF | ND | 0.5 | | | | — |
| 1,2,3,6,7,8-HxCDF | ND | 0.4 | | | | — |
| 2,3,4,6,7,8-HxCDF | ND | 0.4 | | | | — |
| 1,2,3,7,8,9-HxCDF | ND | 0.6 | | | | — |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.5 | | | | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.9 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.4 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | ND | | 0.6 | | — |
| Total PeCDD | ND | | 0.9 | | — |
| Total HxCDD | ND | | 0.8 | | — |
| Total HpCDD | ND | | 1.0 | | — |
| Total TCDF | 1.8 | 1 | | | — |
| Total PeCDF | ND | | 0.5 | | — |
| Total HxCDF | ND | | 0.4 | | — |
| Total HpCDF | ND | | 0.6 | | — |

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TL-RTP Project: 28462B
Client Sample: K40036F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943202

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-21 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943195 |
| Sample Size: | 25.320 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | BB | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 1.7 | | | 0.66 | 25:13 | — |
| 1,2,3,7,8-PeCDD | EMPC | | 0.93 | | | — |
| 1,2,3,4,7,8-HxCDD | ND | 0.4 | | | | — |
| 1,2,3,6,7,8-HxCDD | 2.3 | | | 1.19 | 32:53 | — |
| 1,2,3,7,8,9-HxCDD | EMPC | | 0.38 | | | — |
| 1,2,3,4,6,7,8-HpCDD | 3.2 | | | 1.13 | 36:02 | — |
| 1,2,3,4,6,7,8,9-OCDD | EMPC | | 2.3 | | | — |
| 2,3,7,8-TCDF | 2.2 ~~2.1~~ | | | 0.70 | 24:28 | PR |
| 1,2,3,7,8-PeCDF | 0.50 | | | 1.56 | 28:34 | — |
| 2,3,4,7,8-PeCDF | 3.7 | | | 1.56 | 29:16 | — |
| 1,2,3,4,7,8-HxCDF | 0.33 | | | 1.20 | 32:06 | — |
| 1,2,3,6,7,8-HxCDF | 0.46 | | | 1.20 | 32:13 | — |
| 2,3,4,6,7,8-HxCDF | 0.55 | | | 1.20 | 32:41 | — |
| 1,2,3,7,8,9-HxCDF | 0.49 | | | 1.20 | 33:26 | — |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.3 | | | | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.6 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.1 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 1.7 | 1 | | | — |
| Total PeCDD | EMPC | | | 0.93 | — |
| Total HxCDD | 2.5 | 1 | | 3.2 | — |
| Total HpCDD | 3.2 | 1 | | | — |
| Total TCDF | 3.4 | 3 | | 14.1 | E |
| Total PeCDF | 4.9 | 3 | | 11.0 | E |
| Total HxCDF | 3.0 | 6 | | 3.5 | — |
| Total HpCDF | ND | | 0.4 | | — |

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Printed: 22:21 07/20/94

BLASLAND & BOUCK ENGINEERS, P.C.

TL-RTP Project: 28462B
Client Sample: K40045F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943199

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-18 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943195 |
| Sample Size: | 25.180 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | BB | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.57 | | | 0.66 | 25:15 | — |
| 1,2,3,7,8-PeCDD | ND | 0.3 | | | | — |
| 1,2,3,4,7,8-HxCDD | ND | 0.4 | | | | — |
| 1,2,3,6,7,8-HxCDD | ND | 0.3 | | | | — |
| 1,2,3,7,8,9-HxCDD | ND | 0.4 | | | | — |
| 1,2,3,4,6,7,8-HpCDD | ND | 0.7 | | | | — |
| 1,2,3,4,6,7,8,9-OCDD | ND | 1.8 | | | | — |
| 2,3,7,8-TCDF | 4.2 ~~3.8~~ | | | 0.74 | 24:31 | PR |
| 1,2,3,7,8-PeCDF | ND | 0.1 | | | | — |
| 2,3,4,7,8-PeCDF | 0.86 | | | 1.43 | 29:16 | — |
| 2,3,4,7,8-HxCDF | ND | 0.2 | | | | — |
| 1,2,3,6,7,8-HxCDF | ND | 0.2 | | | | — |
| 2,3,4,6,7,8-HxCDF | ND | 0.2 | | | | — |
| 1,2,3,7,8,9-HxCDF | ND | 0.3 | | | | — |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.4 | | | | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.7 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.5 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 0.57 | 1 | | | — |
| Total PeCDD | ND | | 0.3 | | — |
| Total HxCDD | ND | | 0.4 | | — |
| Total HpCDD | ND | | 0.7 | | — |
| Total TCDF | 13.0 | 3 | | 21.2 | E |
| Total PeCDF | 4.6 | 2 | | 7.9 | E |
| Total HxCDF | 0.86 | 2 | | | — |
| Total HpCDF | ND | | 0.5 | | — |

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X237_PSR v:1.07, LARS 5.13.02

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Printed: 21:12 07/20/94

TL-RTP Project: 28462B
Client Sample: K40095F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943203

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-22 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943195 |
| Sample Size: | 25.250 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | BB | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 13.0 | | | 0.77 | 25:15 | |
| 1,2,3,7,8-PeCDD | 6.9 | | | 1.64 | 29:40 | |
| 1,2,3,4,7,8-HxCDD | 1.9 | | | 1.25 | 32:51 | |
| 1,2,3,6,7,8-HxCDD | 11.5 | | | 1.25 | 32:56 | |
| 1,2,3,7,8,9-HxCDD | 2.0 | | | 1.25 | 33:14 | |
| 1,2,3,4,6,7,8-HpCDD | 22.7 | | | 0.98 | 36:07 | |
| 1,2,3,4,6,7,8,9-OCDD | 14.4 | | | 0.85 | 39:32 | |
| 2,3,7,8-TCDF | ~~6.4~~ EMPC | | 8.7 | 0.77 | 24:29 | |
| 1,2,3,7,8-PeCDF | EMPC | | 1.4 | | | |
| 2,3,4,7,8-PeCDF | 7.5 | | | 1.59 | 29:18 | |
| 2,3,4,7,8-HxCDF | 3.0 | | | 1.37 | 32:09 | |
| 1,2,3,6,7,8-HxCDF | 2.1 | | | 1.37 | 32:15 | |
| 2,3,4,6,7,8-HxCDF | 1.5 | | | 1.37 | 32:44 | |
| 1,2,3,7,8,9-HxCDF | 1.1 | | | 1.37 | 33:27 | |
| 1,2,3,4,6,7,8-HpCDF | 2.4 | | | 1.00 | 35:06 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 1.0 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.8 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 13.0 | 1 | | | |
| Total PeCDD | 6.9 | 1 | | | |
| Total HxCDD | 19.6 | 5 | | | |
| Total HpCDD | 22.7 | 1 | | | |
| Total TCDF | 23.6 | 7 | | 43.7 | E |
| Total PeCDF | 19.4 | 3 | | 27.7 | E |
| Total HxCDF | 12.5 | 6 | | 15.5 | |
| Total HpCDF | 4.7 | 2 | | | |

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Printed: 22:26 07/20/94

TL-RTP Project: 28462A
Client Sample: K40113F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944170

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-7 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.570 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.78 | | | 0.68 | 26:52 | |
| 1,2,3,7,8-PeCDD | EMPC | | 0.18 | | | |
| 1,2,3,4,7,8-HxCDD | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDD | 0.22 | | | 1.19 | 34:30 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8-HpCDD | 0.29 | | | 1.06 | 37:48 | |
| 1,2,3,4,6,7,8,9-OCDD | 0.67 | | | 0.79 | 41:30 | |
| 2,3,7,8-TCDF | 4.4 ~~3.8~~ | | | 0.70 | 26:06 | |
| 1,2,3,7,8-PeCDF | EMPC | | 0.24 | | | |
| 2,3,4,7,8-PeCDF | 0.66 | | | 1.54 | 30:54 | |
| 1,2,3,4,7,8-HxCDF | EMPC | | 0.10 | | | |
| 1,2,3,6,7,8-HxCDF | 0.08 | | | 1.16 | 33:48 | |
| 2,3,4,6,7,8-HxCDF | 0.17 | | | 1.16 | 34:18 | |
| 1,2,3,7,8,9-HxCDF | ND | 0.1 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 0.07 | | | 1.16 | 36:46 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.3 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 0.78 | 1 | | | |
| Total PeCDD | EMPC | | | 0.52 | |
| Total HxCDD | 0.24 | 1 | | | |
| Total HpCDD | 0.29 | 1 | | | |
| Total TCDF | 4.1 | 2 | | 5.5 | E |
| Total PeCDF | 1.2 | 3 | | 2.6 | E |
| Total HxCDF | 0.89 | 4 | | 1.2 | E |
| Total HpCDF | 0.08 | 1 | | | |

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Printed: 21:06 07/21/94

TL-RTP Project: 28462B
Client Sample: K40123F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943187

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-15 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943176 |
| Sample Size: | 25.220 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | JW | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | EMPC | | 4.7 | | | |
| 1,2,3,7,8-PeCDD | ND | 2.2 | | | | |
| 1,2,3,4,7,8-HxCDD | ND | 2.2 | | | | |
| 1,2,3,6,7,8-HxCDD | 2.1 | | | 1.38 | 32:49 | |
| 1,2,3,7,8,9-HxCDD | ND | 2.0 | | | | |
| 1,2,3,4,6,7,8-HpCDD | 5.4 | | | 0.92 | 35:56 | |
| 1,2,3,4,6,7,8,9-OCDD | EMPC | | 3.1 | | | |
| 2,3,7,8-TCDF | 3.6 ~~3.5~~ | | | 0.78 | 24:24 | |
| 1,2,3,7,8-PeCDF | ND | 1.1 | | | | |
| 2,3,4,7,8-PeCDF | EMPC | | 2.0 | | | |
| 2,3,4,7,8-HxCDF | ND | 1.3 | | | | |
| 1,2,3,6,7,8-HxCDF | ND | 1.0 | | | | |
| 1,2,3,4,6,7,8-HxCDF | ND | 1.2 | | | | |
| 1,2,3,7,8,9-HxCDF | ND | 1.6 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | 1.4 | | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 2.6 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 4.8 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | EMPC | | | 4.7 | |
| Total PeCDD | ND | | 2.2 | | |
| Total HxCDD | 2.3 | 1 | | | |
| Total HpCDD | 5.4 | 1 | | | |
| Total TCDF | 6.1 | 2 | | 6.7 | |
| Total PeCDF | EMPC | | | 2.6 | |
| Total HxCDF | ND | | 1.2 | | |
| Total HpCDF | ND | | 1.9 | | |

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Printed: 20:39 07/20/94

# BLASLAND & BOUCK ENGINEERS P.C.

TL-RTP Project: 28462A — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: K40135F — Analysis File: S944167

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-4 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.240 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 1.3 | | | 0.77 | 26:50 | |
| 1,2,3,7,8-PeCDD | 0.23 | | | 1.76 | 31:13 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDD | 0.30 | | | 1.06 | 34:29 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8-HpCDD | EMPC | | 0.23 | | | |
| 1,2,3,4,6,7,8,9-OCDD | 1.1 | | | 0.90 | 41:30 | |
| 2,3,7,8-TCDF | 17.2 ~~16.2~~ | | | 0.70 | 26:05 | |
| 1,2,3,7,8-PeCDF | EMPC | | 0.31 | | | |
| 2,3,4,7,8-PeCDF | EMPC | | 0.65 | | | |
| 1,2,3,4,7,8-HxCDF | ND | 0.1 | | | | |
| ',3,6,7,8-HxCDF | ND | 0.09 | | | | |
| ,4,6,7,8-HxCDF | 0.17 | | | 1.08 | 34:17 | |
| 1,2,3,7,8,9-HxCDF | ND | 0.1 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.2 | | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.6 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 1.3 | 1 | | | |
| Total PeCDD | 0.23 | 1 | | | |
| Total HxCDD | 0.33 | 1 | | | |
| Total HpCDD | EMPC | | | 0.23 | |
| Total TCDF | 17.1 | 4 | | 19.3 | E |
| Total PeCDF | 0.50 | 2 | | 2.2 | E |
| Total HxCDF | 0.35 | 2 | | | |
| Total HpCDF | ND | | 0.2 | | |

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Printed: 19:51 07/21/94

TL-RTP Project: 28462B
Client Sample: K40154F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943188

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-16 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943176 |
| Sample Size: | 25.230 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | JW | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 4.9 | | | 0.78 | 25:08 | — |
| 1,2,3,7,8-PeCDD | EMPC | | 2.8 | | | — |
| 1,2,3,4,7,8-HxCDD | ND | 1.7 | | | | — |
| 1,2,3,6,7,8-HxCDD | 1.7 | | | 1.26 | 32:48 | — |
| 1,2,3,7,8,9-HxCDD | ND | 1.5 | | | | — |
| 1,2,3,4,6,7,8-HpCDD | EMPC | | 2.7 | | | — |
| 1,2,3,4,6,7,8,9-OCDD | 2.0 | | | 0.96 | 39:19 | — |
| 2,3,7,8-TCDF | 4.6 ~~4.1~~ | | | 0.73 | 24:23 | — |
| 1,2,3,7,8-PeCDF | ND | 1.0 | | | | — |
| 2,3,4,7,8-PeCDF | 4.2 | | | 1.68 | 29:11 | — |
| 1,2,3,4,7,8-HxCDF | ND | 1.0 | | | | — |
| 1,2,3,6,7,8-HxCDF | ND | 0.7 | | | | — |
| 2,3,4,6,7,8-HxCDF | 0.94 | | | 1.42 | 32:34 | — |
| 1,2,3,7,8,9-HxCDF | EMPC | | 1.6 | | | — |
| 1,2,3,4,6,7,8-HpCDF | ND | 1.0 | | | | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 1.8 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 3.0 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 4.9 | 1 | | | — |
| Total PeCDD | EMPC | | | 2.8 | — |
| Total HxCDD | 1.9 | 1 | | | — |
| Total HpCDD | 0.66 | 1 | | 3.4 | — |
| Total TCDF | 6.7 | 2 | | 23.4 | E |
| Total PeCDF | 4.3 | 1 | | 15.6 | E |
| Total HxCDF | 2.2 | 2 | | 5.2 | — |
| Total HpCDF | 0.80 | 1 | | | — |

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TL-RTP Project: 28462B
Client Sample: K40164F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943186

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-14 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943176 |
| Sample Size: | 25.010 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | JW | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.8 | | | | — |
| 1,2,3,7,8-PeCDD | ND | 1.2 | | | | — |
| 1,2,3,4,7,8-HxCDD | ND | 1.2 | | | | — |
| 1,2,3,6,7,8-HxCDD | ND | 1.0 | | | | — |
| 1,2,3,7,8,9-HxCDD | ND | 1.0 | | | | — |
| 1,2,3,4,6,7,8-HpCDD | ND | 1.8 | | | | — |
| 1,2,3,4,6,7,8,9-OCDD | ND | 6.7 | | | | — |
| 2,3,7,8-TCDF | 17.5 ~~17.7~~ | | | 0.69 | 24:23 | — |
| 1,2,3,7,8-PeCDF | ND | 0.7 | | | | — |
| 2,3,4,7,8-PeCDF | ND | 0.6 | | | | — |
| 1,2,3,4,7,8-HxCDF | ND | 0.7 | | | | — |
| 2,3,6,7,8-HxCDF | ND | 0.5 | | | | — |
| 2,3,4,6,7,8-HxCDF | ND | 0.6 | | | | — |
| 1,2,3,7,8,9-HxCDF | ND | 0.8 | | | | — |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.8 | | | | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 1.5 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 5.7 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | ND | | 0.8 | | — |
| Total PeCDD | ND | | 1.2 | | — |
| Total HxCDD | ND | | 1.1 | | — |
| Total HpCDD | ND | | 1.8 | | — |
| Total TCDF | 17.7 | 1 | | 23.1 | — |
| Total PeCDF | EMPC | | | 1.3 | — |
| Total HxCDF | ND | | 0.6 | | — |
| Total HpCDF | ND | | 1.1 | | — |

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TL-RTP Project: 28462A — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: K40188F — Analysis File: S944168

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-5 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.240 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 2.5 | | | 0.77 | 26:50 | — |
| 1,2,3,7,8-PeCDD | 1.0 | | | 1.56 | 31:14 | — |
| 1,2,3,4,7,8-HxCDD | 0.67 | | | 1.25 | 34:25 | — |
| 1,2,3,6,7,8-HxCDD | 2.8 | | | 1.25 | 34:30 | — |
| 1,2,3,7,8,9-HxCDD | 0.55 | | | 1.25 | 34:49 | — |
| 1,2,3,4,6,7,8-HpCDD | 8.7 | | | 1.09 | 37:49 | — |
| 1,2,3,4,6,7,8,9-OCDD | 4.6 | | | 0.90 | 41:30 | — |
| 2,3,7,8-TCDF | 7.8 ~~6.5~~ | | | 0.67 | 26:05 | — |
| 1,2,3,7,8-PeCDF | 0.92 | | | 1.62 | 30:10 | — |
| 2,3,4,7,8-PeCDF | 2.6 | | | 1.62 | 30:53 | — |
| 1,2,3,4,7,8-HxCDF | 0.34 | | | 1.23 | 33:42 | — |
| 1,2,3,6,7,8-HxCDF | 0.41 | | | 1.23 | 33:48 | — |
| 2,3,4,6,7,8-HxCDF | 0.44 | | | 1.23 | 34:18 | — |
| 1,2,3,7,8,9-HxCDF | 0.37 | | | 1.23 | 35:05 | — |
| 1,2,3,4,6,7,8-HpCDF | 0.49 J | | | 0.96 | 36:52 | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.2 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.5 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 2.5 | 1 | | | — |
| Total PeCDD | 1.0 | 1 | | | — |
| Total HxCDD | 4.2 | 3 | | | — |
| Total HpCDD | 9.0 | 2 | | | — |
| Total TCDF | 7.0 | 4 | | 13.7 | PME |
| Total PeCDF | 4.4 | 5 | | 8.2 | PME |
| Total HxCDF | 2.4 | 6 | | 3.0 | PME |
| Total HpCDF | 1.1 | 2 | | | PME |

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X237_PSR v:1.07, LARS 5.13.02

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TL-RTP Project: 28462A
Client Sample: K40190F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944173

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-10 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.290 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.49 | | | 0.80 | 26:51 | |
| 1,2,3,7,8-PeCDD | 0.22 | | | 1.57 | 31:14 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDD | ND | 0.2 | | | | |
| 1,2,3,7,8,9-HxCDD | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8-HpCDD | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8,9-OCDD | ND | 0.5 | | | | |
| 2,3,7,8-TCDF | ~~4.2~~ ~~3.6~~ | | | 0.65 | 26:05 | |
| 1,2,3,7,8-PeCDF | EMPC | | 0.16 | | | |
| 2,3,4,7,8-PeCDF | 0.51 | | | 1.72 | 30:53 | |
| 1,2,3,4,7,8-HxCDF | ND | 0.10 | | | | |
| 1,2,3,6,7,8-HxCDF | ND | 0.08 | | | | |
| 1,2,3,4,6,7,8-HxCDF | EMPC | | 0.13 | | | |
| 1,2,3,7,8,9-HxCDF | ND | 0.1 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.1 | | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.4 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 0.49 | 1 | | | |
| Total PeCDD | 0.22 | 1 | | | |
| Total HxCDD | ND | | 0.2 | | |
| Total HpCDD | ND | | 0.2 | | |
| Total TCDF | 3.6 | 1 | | 3.9 | |
| Total PeCDF | 0.72 | 2 | | 1.1 | E |
| Total HxCDF | 0.06 | 1 | | 0.20 | |
| Total HpCDF | ND | | 0.1 | | |

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Printed: 20:07 07/21/94

TL-RTP Project: 28462A
Client Sample: K40241F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944172

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-9 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.720 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | EMPC | | 0.31 | | | — |
| 1,2,3,7,8-PeCDD | 0.43 J | | | 1.33 | 31:14 | — |
| 1,2,3,4,7,8-HxCDD | ND | 0.3 | | | | — |
| 1,2,3,6,7,8-HxCDD | ND | 0.2 | | | | — |
| 1,2,3,7,8,9-HxCDD | ND | 0.3 | | | | — |
| 1,2,3,4,6,7,8-HpCDD | ND | 0.5 | | | | — |
| 1,2,3,4,6,7,8,9-OCDD | EMPC | | 0.45 | | | — |
| 2,3,7,8-TCDF | 0.49 | | | 0.65 | 26:06 | — |
| 1,2,3,7,8-PeCDF | ND | 0.2 | | | | — |
| 2,3,4,7,8-PeCDF | 0.35 | | | 1.59 | 30:54 | — |
| 1,2,3,4,7,8-HxCDF | ND | 0.2 | | | | — |
| 1,2,3,6,7,8-HxCDF | ND | 0.1 | | | | — |
| 2,3,4,6,7,8-HxCDF | ND | 0.2 | | | | — |
| 1,2,3,7,8,9-HxCDF | ND | 0.2 | | | | — |
| 1,2,3,4,6,7,8-HpCDF | 0.18 J | | | 1.07 | 37:18 | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.6 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.1 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | EMPC | | | 0.31 | — |
| Total PeCDD | 0.43 | 1 | | | — |
| Total HxCDD | ND | | 0.3 | | — |
| Total HpCDD | EMPC | | | 0.15 | — |
| Total TCDF | 0.49 | 1 | | 3.1 | E |
| Total PeCDF | 0.35 | 1 | | 1.6 | E |
| Total HxCDF | 0.17 | 1 | | | |
| Total HpCDF | 0.22 | 1 | | | Q |

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Printed: 01:09 07/21/9

TL-RTP Project: 28462A
Client Sample: K40253F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944171

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-8 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.010 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.91 | | | 0.76 | 26:50 | |
| 1,2,3,7,8-PeCDD | 0.19 | | | 1.44 | 31:13 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDD | 0.19 | | | 1.28 | 34:29 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8-HpCDD | EMPC | | 0.18 | | | |
| 1,2,3,4,6,7,8,9-OCDD | 0.49 | | | 0.89 | 41:31 | |
| 2,3,7,8-TCDF | 3.7 ~~3.4~~ | | | 0.71 | 26:05 | |
| 1,2,3,7,8-PeCDF | 0.16 | | | 1.55 | 30:09 | |
| 2,3,4,7,8-PeCDF | EMPC | | 0.43 | | | |
| 1,2,3,4,7,8-HxCDF | ND | 0.1 | | | | |
| 1,2,3,6,7,8-HxCDF | ND | 0.09 | | | | |
| 2,3,4,6,7,8-HxCDF | 0.15 | | | 1.26 | 34:18 | |
| 1,2,3,7,8,9-HxCDF | ND | 0.1 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.2 | | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.6 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 0.91 | 1 | | | |
| Total PeCDD | 0.19 | 1 | | | |
| Total HxCDD | 0.20 | 1 | | | |
| Total HpCDD | EMPC | | | 0.18 | |
| Total TCDF | 3.8 | 5 | | 5.2 | E |
| Total PeCDF | 0.80 | 3 | | 1.7 | E |
| Total HxCDF | 0.34 | 2 | | 0.47 | |
| Total HpCDF | ND | | 0.2 | | |

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TL-RTP Project: 28462A
Client Sample: K40258F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944169

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-6 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.220 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 2.6 | | | 0.76 | 26:51 | |
| 1,2,3,7,8-PeCDD | 0.69 | | | 1.64 | 31:14 | |
| 1,2,3,4,7,8-HxCDD | 0.45 | | | 1.15 | 34:25 | |
| 1,2,3,6,7,8-HxCDD | 2.8 | | | 1.15 | 34:30 | |
| 1,2,3,7,8,9-HxCDD | EMPC | | 0.24 | | | |
| 1,2,3,4,6,7,8-HpCDD | 5.8 | | | 1.04 | 37:51 | |
| 1,2,3,4,6,7,8,9-OCDD | 3.6 | | | 0.87 | 41:32 | |
| 2,3,7,8-TCDF | 0.39 | | | 0.77 | 26:06 | |
| 1,2,3,7,8-PeCDF | 0.09 | | | 1.57 | 30:13 | |
| 2,3,4,7,8-PeCDF | 1.1 | | | 1.57 | 30:54 | |
| ?,4,7,8-HxCDF | 0.18 | | | 1.16 | 33:42 | |
| ,6,7,8-HxCDF | 0.28 | | | 1.16 | 33:48 | |
| 4,6,7,8-HxCDF | 0.27 | | | 1.16 | 34:18 | |
| 1,2,3,7,8,9-HxCDF | 0.11 | | | 1.16 | 35:05 | |
| 1,2,3,4,6,7,8-HpCDF | 0.34 J | | | 0.89 | 36:53 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.3 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 2.6 | 1 | | | |
| Total PeCDD | 0.69 | 1 | | | |
| Total HxCDD | 3.4 | 2 | | 3.7 | |
| Total HpCDD | 5.8 | 1 | | | |
| Total TCDF | 0.61 | 2 | | 3.1 | E |
| Total PeCDF | 1.2 | 2 | | 2.7 | E |
| Total HxCDF | 1.2 | 6 | | 1.4 | E |
| Total HpCDF | 0.59 | 2 | | | Q |

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# BLASLAND & BOUCK ENGINEERS, P.C.

TL-RTP Project: 28462A
Client Sample: K40280F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944165

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-2 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.420 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | JW | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 4.0 | | | 0.88 | 26:50 | |
| 1,2,3,7,8-PeCDD | 0.34 | | | 1.46 | 31:13 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.4 | | | | |
| 1,2,3,6,7,8-HxCDD | 0.34 | | | 1.09 | 34:29 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.4 | | | | |
| 1,2,3,4,6,7,8-HpCDD | ND | 0.4 | | | | |
| 1,2,3,4,6,7,8,9-OCDD | ND | 1.2 | | | | |
| 2,3,7,8-TCDF | 4.1 ~~3.1~~ | | | 0.67 | 26:05 | |
| 1,2,3,7,8-PeCDF | ND | 0.2 | | | | |
| 2,3,4,7,8-PeCDF | 0.60 | | | 1.55 | 30:53 | |
| 1,2,3,4,7,8-HxCDF | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDF | ND | 0.2 | | | | |
| 2,3,4,6,7,8-HxCDF | EMPC | | 0.25 | | | |
| 1,2,3,7,8,9-HxCDF | 0.43 | | | 1.29 | 35:04 | |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.3 | | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.4 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.0 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 4.0 | 1 | | | |
| Total PeCDD | 0.34 | 1 | | | |
| Total HxCDD | 0.37 | 1 | | | |
| Total HpCDD | ND | | 0.4 | | |
| Total TCDF | 3.1 | 1 | | 5.3 | E |
| Total PeCDF | 0.61 | 1 | | 2.1 | E |
| Total HxCDF | 0.94 | 2 | | 1.6 | |
| Total HpCDF | ND | | 0.3 | | |

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TL-RTP Project: 28462A — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: K40286F — Analysis File: S944166

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-3 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.110 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 4.8 | | | 0.80 | 26:50 | — |
| 1,2,3,7,8-PeCDD | 0.96 | | | 1.37 | 31:13 | — |
| 1,2,3,4,7,8-HxCDD | 0.51 | | | 1.27 | 34:24 | — |
| 1,2,3,6,7,8-HxCDD | 3.2 | | | 1.27 | 34:30 | — |
| 1,2,3,7,8,9-HxCDD | 0.53 | | | 1.27 | 34:48 | — |
| 1,2,3,4,6,7,8-HpCDD | 12.7 | | | 1.06 | 37:49 | — |
| 1,2,3,4,6,7,8,9-OCDD | 9.3 | | | 0.83 | 41:32 | — |
| 2,3,7,8-TCDF | ~~3.8~~ EMPC | | 5.9 | 0.71 | 26:04 | — |
| 1,2,3,7,8-PeCDF | 0.44 | | | 1.52 | 30:09 | — |
| 2,3,4,7,8-PeCDF | 2.1 | | | 1.52 | 30:53 | — |
| 1,2,3,4,7,8-HxCDF | 0.50 | | | 1.22 | 33:41 | — |
| 1,2,3,6,7,8-HxCDF | 0.36 | | | 1.22 | 33:47 | — |
| 2,3,4,6,7,8-HxCDF | 0.39 | | | 1.22 | 34:18 | — |
| 1,2,3,7,8,9-HxCDF | 0.16 | | | 1.22 | 35:04 | — |
| 1,2,3,4,6,7,8-HpCDF | 0.73 J | | | 1.04 | 36:55 | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.2 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.4 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 4.8 | 1 | | | — |
| Total PeCDD | 0.96 | 1 | | | — |
| Total HxCDD | 4.8 | 5 | | | — |
| Total HpCDD | 12.7 | 1 | | | — |
| Total TCDF | 4.0 | 2 | | 7.6 | E |
| Total PeCDF | 3.1 | 4 | | 5.0 | E |
| Total HxCDF | 2.1 | 6 | | 2.7 | E |
| Total HpCDF | 1.1 | 2 | | 1.2 | E |

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TL-RTP Project: 28462A
Client Sample: K40305F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944174

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-11 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 24.960 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.36 | | | 0.76 | 26:48 | |
| 1,2,3,7,8-PeCDD | ND | 0.09 | | | | |
| 1,2,3,4,7,8-HxCDD | ND | 0.1 | | | | |
| 1,2,3,6,7,8-HxCDD | ND | 0.09 | | | | |
| 1,2,3,7,8,9-HxCDD | ND | 0.09 | | | | |
| 1,2,3,4,6,7,8-HpCDD | 0.15 | | | 0.88 | 37:47 | |
| 1,2,3,4,6,7,8,9-OCDD | EMPC | | 0.47 | | | |
| 2,3,7,8-TCDF | 0.60 | | | 0.67 | 26:04 | |
| 1,2,3,7,8-PeCDF | ND | 0.06 | | | | |
| 2,3,4,7,8-PeCDF | 0.12 | | | 1.61 | 30:53 | |
| ,3,4,7,8-HxCDF | ND | 0.06 | | | | |
| ,6,7,8-HxCDF | ND | 0.04 | | | | |
| ,4,6,7,8-HxCDF | EMPC | | 0.14 | | | |
| 1,2,3,7,8,9-HxCDF | ND | 0.06 | | | | |
| 1,2,3,4,6,7,8-HpCDF | EMPC | | 0.06 | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.09 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.2 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 0.36 | 1 | | | |
| Total PeCDD | ND | | 0.09 | | |
| Total HxCDD | ND | | 0.09 | | |
| Total HpCDD | 0.15 | 1 | | | |
| Total TCDF | 0.70 | 2 | | | |
| Total PeCDF | 0.25 | 2 | | | |
| Total HxCDF | EMPC | | | 0.19 | |
| Total HpCDF | EMPC | | | 0.08 | |

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TL-RTP Project: 28462A
Client Sample: K40321F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944175

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-12 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.440 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | WK | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 1.5 | | | 0.83 | 26:50 | |
| 1,2,3,7,8-PeCDD | EMPC | | 0.36 | | | |
| 1,2,3,4,7,8-HxCDD | 0.84 | | | 1.33 | 34:24 | |
| 1,2,3,6,7,8-HxCDD | 3.7 | | | 1.33 | 34:29 | |
| 1,2,3,7,8,9-HxCDD | 0.30 | | | 1.33 | 34:48 | |
| 1,2,3,4,6,7,8-HpCDD | 12.4 | | | 1.12 | 37:48 | |
| 1,2,3,4,6,7,8,9-OCDD | 8.7 | | | 0.80 | 41:29 | |
| 2,3,7,8-TCDF | 0.96 | | | 0.74 | 26:05 | |
| 1,2,3,7,8-PeCDF | 0.15 | | | 1.45 | 30:09 | |
| 2,3,4,7,8-PeCDF | EMPC | | 0.50 | | | |
| 1,2,3,4,7,8-HxCDF | 0.42 | | | 1.23 | 33:41 | |
| 1,2,3,7,8,8-HxCDF | 0.34 | | | 1.23 | 33:47 | |
| 1,2,3,6,7,8-HxCDF | 0.26 | | | 1.23 | 34:17 | |
| 1,2,3,7,8,9-HxCDF | 0.13 | | | 1.23 | 35:04 | |
| 1,2,3,4,6,7,8-HpCDF | 0.74 | | | 1.07 | 36:47 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.1 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.2 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 1.5 | 1 | | | |
| Total PeCDD | EMPC | | | 0.36 | |
| Total HxCDD | 6.4 | 5 | | | |
| Total HpCDD | 12.7 | 2 | | | |
| Total TCDF | 1.0 | 2 | | 6.1 | E |
| Total PeCDF | 0.15 | 1 | | 3.0 | E |
| Total HxCDF | 1.7 | 6 | | 2.2 | E |
| Total HpCDF | 1.2 | 2 | | | |

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TL-RTP Project: 28462B — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: K40353F — Analysis File: W943201

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-20 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943195 |
| Sample Size: | 25.150 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | BB | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 4.7 | | | 0.79 | 25:13 | |
| 1,2,3,7,8-PeCDD | 0.44 | | | 1.52 | 29:37 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.4 | | | | |
| 1,2,3,6,7,8-HxCDD | 0.55 | | | 1.14 | 32:53 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8-HpCDD | 0.65 | | | 1.01 | 36:01 | |
| 1,2,3,4,6,7,8,9-OCDD | EMPC | | 1.8 | | | |
| 2,3,7,8-TCDF | 7.1 ~~5.9~~ | | | 0.74 | 24:29 | |
| 1,2,3,7,8-PeCDF | 0.49 | | | 1.39 | 28:34 | |
| 2,3,4,7,8-PeCDF | EMPC | | 1.2 | | | |
| 1,2,3,4,7,8-HxCDF | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDF | ND | 0.2 | | | | |
| 2,3,4,6,7,8-HxCDF | ND | 0.2 | | | | |
| 1,2,3,7,8,9-HxCDF | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.3 | | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.6 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.5 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 4.7 | 1 | | | |
| Total PeCDD | 0.44 | 1 | | 0.99 | |
| Total HxCDD | 0.60 | 1 | | | |
| Total HpCDD | 0.65 | 1 | | | |
| Total TCDF | 7.1 | 2 | | 9.8 | E |
| Total PeCDF | 0.68 | 2 | | 4.0 | E |
| Total HxCDF | 0.54 | 1 | | 1.6 | |
| Total HpCDF | ND | | 0.4 | | |

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Triangle Laboratories of RTP, Inc.
801 Capitola Drive • Durham, North Carolina 27713
Phone: (919) 544-5729 • Fax: (919) 544-5491

Printed: 22:18 07/20/94

TL-RTP Project: 28462B
Client Sample: K40361F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943185

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-13 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/14/94 | CONCAL: | W943176 |
| Sample Size: | 25.100 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | JW | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 16.0 | | | 0.88 | 25:08 | |
| 1,2,3,7,8-PeCDD | 1.5 | | | 1.61 | 29:33 | |
| 1,2,3,4,7,8-HxCDD | ND | 1.0 | | | | |
| 1,2,3,6,7,8-HxCDD | EMPC | | 7.4 | | | |
| 1,2,3,7,8,9-HxCDD | 1.3 | | | 1.26 | 33:07 | |
| 1,2,3,4,6,7,8-HpCDD | 29.9 | | | 1.15 | 35:58 | |
| 1,2,3,4,6,7,8,9-OCDD | 22.8 | | | 0.90 | 39:23 | |
| 2,3,7,8-TCDF | ~~8.8~~ EMPC | | 13.3 | 0.78 | 24:23 | |
| 1,2,3,7,8-PeCDF | 1.1 | | | 1.67 | 28:29 | |
| 2,3,4,7,8-PeCDF | 4.6 | | | 1.67 | 29:12 | |
| 1,2,3,4,7,8-HxCDF | 1.6 | | | 1.19 | 32:02 | |
| 1,2,3,6,7,8-HxCDF | 1.2 | | | 1.19 | 32:08 | |
| 2,3,4,6,7,8-HxCDF | 0.66 | | | 1.19 | 32:38 | |
| 1,2,3,7,8,9-HxCDF | ND | 0.7 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 2.1 J | | | 1.18 | 34:59 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.9 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.4 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 16.0 | 1 | | | |
| Total PeCDD | 1.5 | 1 | | 2.2 | |
| Total HxCDD | 2.5 | 2 | | 12.1 | |
| Total HpCDD | 29.9 | 1 | | | |
| Total TCDF | 11.7 | 2 | | 30.2 | E |
| Total PeCDF | 8.2 | 3 | | 14.4 | E |
| Total HxCDF | 7.8 | 6 | | | |
| Total HpCDF | 3.5 | 2 | | | |

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Printed: 20:38 07/20/94

# BLASLAND & BOUCK ENGINEERS, P.C.

TLRTP Project: 28462B
Client Sample: K40431F

## Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W943204

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-23 | Date Extracted: | 07/06/94 | ICAL: | WF53044 |
| | | Date Analyzed: | 07/15/94 | CONCAL: | W943195 |
| Sample Size: | 25.310 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | W943184 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | JW | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.2 | | | | — |
| 1,2,3,7,8-PeCDD | ND | 0.3 | | | | — |
| 1,2,3,4,7,8-HxCDD | ND | 0.3 | | | | — |
| 1,2,3,6,7,8-HxCDD | ND | 0.3 | | | | — |
| 1,2,3,7,8,9-HxCDD | ND | 0.3 | | | | — |
| 1,2,3,4,6,7,8-HpCDD | ND | 0.5 | | | | — |
| 1,2,3,4,6,7,8,9-OCDD | 1.4 | | | 1.00 | 39:28 | — |
| 2,3,7,8-TCDF | EMPC | | 0.19 | | | — |
| 1,2,3,7,8-PeCDF | ND | 0.2 | | | | — |
| 2,3,4,7,8-PeCDF | ND | 0.1 | | | | — |
| 1,2,3,4,7,8-HxCDF | ND | 0.2 | | | | — |
| ,7,8-HxCDF | ND | 0.2 | | | | — |
| ,6,7,8-HxCDF | ND | 0.2 | | | | — |
| 1,2,3,7,8,9-HxCDF | ND | 0.3 | | | | — |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.3 | | | | — |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.5 | | | | — |
| 1,2,3,4,6,7,8,9-OCDF | ND | 1.1 | | | | — |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | ND | | 0.2 | | — |
| Total PeCDD | ND | | 0.3 | | — |
| Total HxCDD | ND | | 0.3 | | — |
| Total HpCDD | ND | | 0.5 | | — |
| Total TCDF | 0.26 | 1 | | 0.44 | — |
| Total PeCDF | ND | | 0.2 | | — |
| Total HxCDF | ND | | 0.2 | | — |
| Total HpCDF | ND | | 0.3 | | — |

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TL-RTP Project: 28462A
Client Sample: P40406F

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S944164

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | n/a | | | | |
| Sample Matrix: | FISH | Date Received: | 06/30/94 | Spike File: | SPX23725 |
| TLRTP ID: | 83-100-1 | Date Extracted: | 07/06/94 | ICAL: | SF53254 |
| | | Date Analyzed: | 07/16/94 | CONCAL: | S944162 |
| Sample Size: | 25.050 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | S944163 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | JW | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 2.5 | | | 0.82 | 26:48 | |
| 1,2,3,7,8-PeCDD | ND | 0.3 | | | | |
| 1,2,3,4,7,8-HxCDD | ND | 0.4 | | | | |
| 1,2,3,6,7,8-HxCDD | 0.82 | | | 1.21 | 34:29 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8-HpCDD | 4.1 | | | 0.97 | 37:49 | |
| 1,2,3,4,6,7,8,9-OCDD | EMPC | | 2.6 | | | |
| 2,3,7,8-TCDF | EMPC | | 0.46 | | | |
| 1,2,3,7,8-PeCDF | ND | 0.2 | | | | |
| 2,3,4,7,8-PeCDF | 0.40 | | | 1.32 | 30:53 | |
| 2,3,4,7,8-HxCDF | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDF | ND | 0.2 | | | | |
| 2,3,4,6,7,8-HxCDF | ND | 0.2 | | | | |
| 1,2,3,7,8,9-HxCDF | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 0.28 | | | 0.96 | 37:02 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.4 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.6 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 2.5 | 1 | | | |
| Total PeCDD | ND | | 0.3 | | |
| Total HxCDD | 0.89 | 1 | | | |
| Total HpCDD | 4.1 | 1 | | | |
| Total TCDF | EMPC | | | 1.6 | E |
| Total PeCDF | 0.40 | 1 | | 1.1 | E |
| Total HxCDF | ND | | 0.2 | | |
| Total HpCDF | 0.35 | 1 | | | |

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Printed: 19:50 07/21/94

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

POLYCHLORINATED DIBENZO-p-DIOXINS
AND DIBENZOFURANS ANALYSES

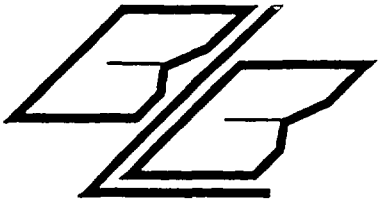
BIOTA - TURTLES

TLI PROJECT# 30206

Analyses performed by:

Triangle Laboratories of RTP, Inc.
Durham, North Carolina

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

## Summary

The following is an assessment of the data package for TLI Project# 30206 for the Biota turtle sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

| Sample ID | Lab ID | Matrix | Sample Date | Extraction Date | Analysis Date |
|---|---|---|---|---|---|
| K42001 | 90-156-1 | turtle | 10/31/94 | 11/7/94 | 11/11/94 |
| K42022 | 90-156-2 | turtle | 10/31/94 | 11/7/94 | 11/11/94 |
| K42033* | 90-156-3 | turtle | 10/31/94 | 11/7/94 | 11/11/94 |
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* MS/MSD performed on sample

## Introduction

Analyses were performed according to the USEPA Method 8290, Rev.0 - 11/90.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

Concentration qualifiers:

ND The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

EMPC The "estimated maximum possible concentration" is reported when GC/MS signals eluting within the established retention time window have a signal-to-noise ratio in excess of 2.5 but do not meet the ion abundance ratio criteria.

Quantitation qualifiers:

B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

S The compound has exceeded the normal dynamic range.

I The labeled compound may be falsely elevated due to coeluting peak(s).

Q The reported concentrations and percent recoveries may be over or under estimated due to a quantitative interference.

N The $^{13}C$-labeled internal standard has a S/N ratio of less than 10:1.

V The analytical results are considered valid even though the internal standard recoveries are below the QC limit.

RO The ion abundance ratios of the internal standards are outside of the acceptable range.

PR The reported concentration may be underestimated due to a poorly resolved GC peak.

U The reported concentration may be underestimated due to the presence of a large closely eluting peak.

Validation qualifiers:

J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

1. Holding Time

The method-specified holding time for extraction of samples is 30 days from sample collection. Samples must be analyzed within 45 days of collection. No deviations from these holding time requirements were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method or field blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks measure contamination of samples during field operations.

1,2,3,4,6,7,8,9-OCDD and 2,3,4,6,7,8-HxCDF were observed in the method blank. These compounds were detected in the associated samples K42001, K42022 and K42033 at levels less than 5 times the method blank and have been qualified as non-detected. 1,2,3,4,6,7,8-HpCDD was also detected in the method blank. This compound was detected in the associated samples K42022 and K42033 at levels less than 5 times the method blank and have been qualified as non-detected. The compound was detected in sample K42001 at a level greater than 5 times the method blank. The presence of 1,2,3,4,6,7,8-HpCDD in this sample is deemed site-related.

3. Mass Spectrometer Resolution Check

Mass spectrometer tuning and resolution performance was acceptable. Poor GC peak resolution was observed in all samples for compound 2,3,4,6,7,8-HxCDF and in sample K42022 for compound 1,2,3,6,7,8-HxCDF. The amount reported for these compounds may be biased high and have been qualified as estimated.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The % relative standard deviation (%RSD) was less than 20% for all non-labeled compounds (targets) and less than 30% for all labeled compounds (surrogates and internals). All isotope abundance ratios were within the defined limits.

4.2 Continuing Calibration

Continuing calibration target standards were within the 20% difference (%D) of the initial calibration. All isotope abundance ratios were within the defined limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Matrix spike and matrix spike duplicate data is used to assess the precision and accuracy of the analytical method relative to the sample matrixes.

All matrix spike and matrix spike duplicate recoveries and the relative percent differences (RPDs) between recoveries were within acceptable control limits.

7. Internal Standard Performance and Recovery

All samples to be analyzed for PCDD/PCDF compounds are spiked with the internal standard mix prior to extraction, which eliminates the need to correct quantitative data for extraction efficiency.

Internal standard recoveries were below acceptable control limits for 6 standards in sample K42033. All PCDD/PCDF data for this sample are potentially biased low and have been qualified as estimated. Internal standard recoveries for the remaining samples were within acceptable control limits. All isotope abundance ratios and retention times were within acceptable limits.

8. Surrogate/Alternate Standard Compound Recovery

All samples to be analyzed for PCDD/PCDF compounds are spiked with surrogate and alternate standards after extraction and prior to sample cleanup procedures. These standards are used to monitor the efficiency of the cleanup procedures.

Recoveries were below acceptable control limits for 3 surrogates in sample K42033. All PCDD/PCDF data for this sample are potentially biased low and have been qualified as estimated. Surrogate recoveries for the remaining samples were within acceptable control limits. All alternate standard recoveries, isotope abundance ratios, and retention times were within acceptable limits.

9. Recovery Standard Performance

All samples to be analyzed for PCDD/PCDF compounds are spiked with recovery standard prior to injection. The concentrations of all the labeled standards (internal, surrogate and alternate) are determined by using the recovery standard.

All isotope abundance ratios and retention times were within acceptable limits.

10. Compound Identification

PCDD/PCDF compounds are identified on the HRGC/HRMS by using the analyte's ion abundance ratios and retention times. The ion abundance ratios must be within 15% of theoretical values, have a signal to noise ratio (S/N) of greater than 2.5, and the ions must maximize within two seconds of each other. The retention time for the analyte must be within -1 to +3 seconds of the corresponding $^{13}C$-labeled standard.

All compounds identified met the specified criteria.

12. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

# Data Validation Checksheets

## PCDD/PCDF Data Validation Checklist

| | YES | NO | NA |
|---|---|---|---|
| **Data Completeness and Deliverables** | | | |
| Is there a narrative or cover letter present? | X | | |
| Are the samples numbers included in the narrative? | X | | |
| Are the sample chain-of-custodies present? | X | | |
| Do the chain-of-custodies indicate any problems with sample receipt or sample condition? | | X | |
| **Holding Times** | | | |
| Have any holding times been exceeded? | | X | |
| **Internal Standard Performance** | | | |
| Was internal standard data submitted? | X | | |
| Was one or more internal standard recovery outside of specified limits for any sample or blank? | X | | |
| If yes, were the samples reanalyzed? | | X | |
| Was one or more ion abundance ratio or retention time outside of specified limits? | | X | |
| **Surrogate Standard Performance** | | | |
| Was surrogate recovery data submitted? | X | | |
| Was one or more surrogate recovery outside of specified limits for any sample or blank? | X | | |
| If yes, were the samples reanalyzed? | | X | |
| Was one or more ion abundance ratio or retention time outside of specified limits? | | X | |
| **Matrix Spikes** | | | |
| Is there matrix spike recovery data submitted? | X | | |
| Were matrix spikes analyzed at the required frequency? | X | | |
| Were any spike recoveries outside of QC limits? | | X | |
| **Blanks** | | | |
| Is the method blank data submitted? | X | | |
| Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Has a blank been analyzed at least once every twelve hours for each system used? | X | | |
| Is the chromatographic performance acceptable for each instrument? | X | | |
| Do any method/reagent/instrument blanks have positive results? | X | | |
| Do any trip/field/rinse blanks have positive results? | | | X |
| Are there field/rinse/equipment blanks associated with every sample? | | X | |
| **Mass Spectrometer Resolution** | | | |
| Are the GC/MS resolution check data submitted? | X | | |
| Was a resolution of 10000 met for each instrument? | X | | |
| **Target Analytes** | | | |
| Is a PCDD/PCDF analysis results sheet present for each of the following: | | | |
| Samples | X | | |
| Matrix spikes | X | | |
| Blanks | X | | |
| Are the selected ion chromatograms present for each of the following: | | | |
| Samples | X | | |
| Matrix spikes | X | | |
| Blanks | X | | |
| Is the chromatographic performance acceptable with respect to: | | | |
| Baseline stability | X | | |
| Resolution | X | | |
| Peak shape | X | | |
| **Quantitation and Detection Limits** | | | |
| Are the reporting limits adjusted to reflect sample dilutions and for soils, sample moisture? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| **Standard Data** | | | |
| Are the quantitation reports and selected ion chromatograms present for the initial and continuing calibration standards? | X | | |
| **Initial Calibration** | | | |
| Was the initial calibration data submitted for each instrument used? | X | | |
| Are the response factor RSDs within specified limits? | X | | |
| Were the ion abundance ratios within ±15% of theoretical? | X | | |
| Was the signal-to-noise ratio ≥ 10:1 for every ion current profile? | X | | |
| **Continuing Calibration** | | | |
| Was the continuing calibration data submitted for each instrument? | X | | |
| Has a continuing calibration standard been analyzed for each twelve hours of analysis per instrument? | X | | |
| All %D within acceptable limits? | X | | |
| Were the ion abundance ratios within ±15% of theoretical? | X | | |
| Was the signal-to-noise ratio ≥ 10:1 for every ion current profile? | X | | |
| **Field Duplicates** | | | |
| Where field duplicates submitted with the samples? | | X | |

Corrected Sample Analysis Data Sheets

# BLASLAND, BOUCK & LEE

TL-RTP Project: 30206 — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: K42001 = 208372 — Analysis File: T945529

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | 91082 | | | | |
| Sample Matrix: | TURTLE | Date Received: | 10/26/94 | Spike File: | SPX2372S |
| TLRTP ID: | 90-156-1 | Date Extracted: | 11/07/94 | ICAL: | TF5N104 |
| | | Date Analyzed: | 11/15/94 | CONCAL: | T945518 |
| Sample Size: | 20.005 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | T945526 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | MM | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 4.1 | | | 0.78 | 33:22 | |
| 1,2,3,7,8-PeCDD | 1.6 | | | 1.32 | 38:44 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.3 | | | | |
| 1,2,3,6,7,8-HxCDD | 1.8 | | | 1.37 | 42:46 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8-HpCDD | 1.4 | | | 1.18 | 46:19 | B |
| 1,2,3,4,6,7,8,9-OCDD | ~~ND 3.4~~ | 3.4 | | 0.92 | 50:03 | ~~B~~ |
| 2,3,7,8-TCDF | 0.11 | | | 0.81 | 32:34 | |
| 1,2,3,7,8-PeCDF | ND | 0.1 | | | | |
| 2,3,4,7,8-PeCDF | 0.96 | | | 1.73 | 38:17 | |
| 1,2,3,4,7,8-HxCDF | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDF | ND | 0.1 | | | | |
| 2,3,4,6,7,8-HxCDF | ND ~~0.20~~ | 0.2 | | 1.20 | 42:31 | ~~B~~ PR |
| 1,2,3,7,8,9-HxCDF | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.2 | | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.5 | | | | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 4.1 | 1 | | | |
| Total PeCDD | 1.6 | 1 | | | |
| Total HxCDD | 1.8 | 1 | | | |
| Total HpCDD | 1.4 | 1 | | | |
| Total TCDF | 0.11 | 1 | | | |
| Total PeCDF | 0.96 | 1 | | | |
| Total HxCDF | 0.20 | 1 | | | |
| Total HpCDF | ND | | 0.2 | | |





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Printed: 21:39 11/23/9-

# BLASLAND, BOUCK & LEE

TL-RTP Project: 30206 — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: K42022 = 222307 — Analysis File: T945532

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | 91082 | | | | |
| Sample Matrix: | TURTLE | Date Received: | 10/26/94 | Spike File: | SPX2372S |
| TLRTP ID: | 90-156-2 | Date Extracted: | 11/07/94 | ICAL: | TF5N104 |
| | | Date Analyzed: | 11/15/94 | CONCAL: | T945530 |
| Sample Size: | 20.101 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | T945526 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | DB | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | EMPC | | 0.07 | | | |
| 1,2,3,7,8-PeCDD | 0.08 | | | 1.66 | 38:44 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.1 | | | | |
| 1,2,3,6,7,8-HxCDD | 0.13 | | | 1.11 | 42:46 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.1 | | | | |
| 1,2,3,4,6,7,8-HpCDD | ND ~~0.86~~ | 0.56 | | 1.00 | 46:20 | B |
| 1,2,3,4,6,7,8,9-OCDD | ND ~~5.3~~ | 5.3 | | 0.90 | 50:04 | B |
| 2,3,7,8-TCDF | 0.15 | | | 0.69 | 32:34 | |
| 1,2,3,7,8-PeCDF | ND | 0.06 | | | | |
| 2,3,4,7,8-PeCDF | EMPC | | 0.07 | | | |
| 2,3,4,7,8-HxCDF | 0.12 | | | 1.18 | 41:47 | |
| 1,2,3,6,7,8-HxCDF | 0.04 | | | 1.18 | 41:54 | PR J |
| 1,2,3,4,6,7,8-HxCDF | ND ~~0.16~~ | 0.16 | | 1.24 | 42:31 | B PR J |
| 1,2,3,7,8,9-HxCDF | ND | 0.09 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 0.26 | | | 1.14 | 45:13 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.1 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | 0.94 | | | 0.93 | 50:15 | |

| Totals | Conc. (ppt) | Number | DL | EMPC | | Flags |
|---|---|---|---|---|---|---|
| Total TCDD | EMPC | | | 0.16 | | |
| Total PeCDD | 0.08 | 1 | | | | |
| Total HxCDD | 0.13 | 1 | | | | |
| Total HpCDD | 1.7 | 2 | | | | |
| Total TCDF | 0.15 | 1 | | | | |
| Total PeCDF | 0.12 | 1 | | 0.19 | | |
| Total HxCDF | 0.54 | 5 | | | | |
| Total HpCDF | 0.86 | 2 | | | | |



X237_PSR v:1.07, LARS 5.13.16c

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# BLASLAND, BOUCK & LEE

TL-RTP Project: 30206 — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: K42033 = 222796 — Analysis File: T945533

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | 91082 | | | | |
| Sample Matrix: | TURTLE | Date Received: | 10/26/94 | Spike File: | SPX2372S |
| TLRTP ID: | 90-156-3 | Date Extracted: | 11/07/94 | ICAL: | TF5N104 |
| | | Date Analyzed: | 11/15/94 | CONCAL: | T945530 |
| Sample Size: | 20.035 g | Dilution Factor: | n/a | % Moisture: | n/a |
| Dry Weight: | n/a | Blank File: | T945526 | % Lipid: | n/a |
| GC Column: | DB-5 | Analyst: | DB | % Solids: | n/a |

| Analytes | Conc. (ppt) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.78 | | | 0.69 | 33:22 | |
| 1,2,3,7,8-PeCDD | 0.43 | | | 1.55 | 38:44 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDD | 0.69 | | | 1.29 | 42:46 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8-HpCDD | ~~1.4~~ | ~~1.4~~ | | 1.03 | 46:20 | ~~B~~ |
| 1,2,3,4,6,7,8,9-OCDD | ~~ND 7.1~~ | ~~7.1~~ | | 0.86 | 50:04 | ~~B~~ |
| 2,3,7,8-TCDF | 0.20 | | | 0.73 | 32:34 | |
| 1,2,3,7,8-PeCDF | ND | 0.1 | | | | |
| 2,3,4,7,8-PeCDF | 0.87 | | | 1.52 | 38:18 | |
| 1,2,3,4,7,8-HxCDF | ND | 0.2 | | | | |
| 1,2,3,6,7,8-HxCDF | ND | 0.1 | | | | |
| 2,3,4,6,7,8-HxCDF | ~~ND 0.24~~ | 0.24 | | 1.29 | 42:31 | ~~B~~ PR |
| 1,2,3,7,8,9-HxCDF | ND | 0.2 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.2 | | | | |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.3 | | | | |
| 1,2,3,4,6,7,8,9-OCDF | 0.99 | | | 0.90 | 50:16 | |

| Totals | Conc. (ppt) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 0.78 | 1 | | | |
| Total PeCDD | 0.43 | 1 | | | |
| Total HxCDD | 0.69 | 1 | | | |
| Total HpCDD | 2.2 | 2 | | | |
| Total TCDF | 0.20 | 1 | | | |
| Total PeCDF | 0.87 | 1 | | | |
| Total HxCDF | 0.24 | 1 | | | |
| Total HpCDF | 0.56 | 1 | | | |





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DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# 44286

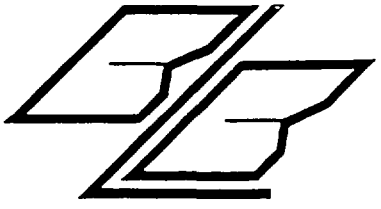
PCB ANALYSES

BIOTA - TURTLES

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

## Summary

The following is an assessment of the PCB data package for SDG # 44286 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and lipids analyses. Analyses were performed on the following samples:

| Sample ID | Lab ID | Matrix | Description | Sample Location | Date of Collection |
|---|---|---|---|---|---|
| K42011M | 221695 | turtle | muscle | Below Allegan Dam | 5/18/94 |
| K42012M | 221696 | turtle | muscle | Below Allegan Dam | 5/18/94 |
| K42014W | 221698 | turtle | whole body | Below Allegan Dam | 5/18/94 |
| K42015W | 221700 | turtle | whole body | Battle Creek | 5/19/94 |
| K42016W | 221788 | turtle | whole body | Battle Creek | 5/21/94 |
| K42017M | 221789 | turtle | muscle | Battle Creek | 5/21/94 |
| K42018M | 221790 | turtle | muscle | Battle Creek | 5/21/94 |
| K42019W* | 222303 | turtle | whole body | Battle Creek | 5/23/94 |
| K42020W | 222305 | turtle | whole body | Below Allegan Dam | 5/23/94 |
| K42021W | 222306 | turtle | whole body | Below Allegan Dam | 5/23/94 |
| K42022M | 222307 | turtle | muscle | Battle Creek | 5/24/94 |
| K42023M | 222353 | turtle | muscle | Battle Creek | 5/25/94 |
| K42024W | 222354 | turtle | whole body | Battle Creek | 5/25/94 |
| K42025M | 222410 | turtle | muscle | Battle Creek | 5/25/94 |
| K42026M | 222411 | turtle | muscle | Battle Creek | 5/25/94 |
| K42027M | 222412 | turtle | muscle | Battle Creek | 5/25/94 |
| K42028M | 222413 | turtle | muscle | Allegan Dam | 5/25/94 |
| K42029M | 222414 | turtle | muscle | Allegan Dam | 5/25/94 |
| K42030W | 222615 | turtle | whole body | Plainwell Dam | 5/26/94 |

* MS/MSD performed on sample

# PCB ANALYSES

## Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

E The compound was quantitated above the calibration range.

D Concentration is based on a diluted sample analysis.

UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

1. Holding Time

There is no specified holding time to extraction for PCBs in biota samples. The specified holding time for PCB analysis is 40 days from extraction. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in the method blanks or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits with the following exception:

HP2087 7/19/94 08:50

Aroclor 1248 16.0%

Since %D of the continuing calibration standard (Aroclor 1242) analyzed with the standard was within acceptable limits and since no Aroclor 1248 was detected in the samples, no qualifiers have been added to the data based on the deviation.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in samples K42019W and K42019WRE. All data for these samples have been qualified as estimated. Recoveries were below acceptable control limits for one surrogate in samples K42014W and K42022M. No qualifiers have been added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries of Aroclor 1254 were above the acceptable control limit in the matrix spike, matrix spike duplicate, and matrix spike blank samples. This can be attributed to the spike concentration in the samples which was above the method linear range. No qualifiers have been added to the samples based on spike performance.

8. General Comments

K42019W and K42019WRE

Sample K42019W had poor surrogate recoveries which were confirmed to be matrix related by the re-extraction and analysis of sample K42019WRE. The data from the original analysis, K42019W, should be used for all Aroclors.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

# DATA REVIEW CHECKLIST

PCB Data Review Checklist

| | YES | NO | NA |
|---|---|---|---|
| **Data Completeness and Deliverables** | | | |
| Is there a narrative or cover letter present? | X | | |
| Are the samples numbers included in the narrative? | X | | |
| Are the sample chain-of-custodies present? | X | | |
| Do the chain-of-custodies indicate any problems with sample receipt or sample condition? | | X | |
| **Holding Times** | | | |
| Have any holding times been exceeded? | | X | |
| **Surrogate Recovery** | | | |
| Are surrogate recovery forms present? | X | | |
| Are all the samples listed on the appropriate surrogate recovery form? | X | | |
| Are the outliers correctly marked with an asterisk? | X | | |
| Were recoveries of TCMX or DCB outside of specified limits for any sample or blank? | X | | |
| If yes, were the samples reanalyzed? | X | | |
| **Matrix Spikes** | | | |
| Is there a matrix spike recovery form present? | X | | |
| Were matrix spikes analyzed at the required frequency? | X | | |
| How many spike recoveries were outside of QC limits? | | | |
| 2 out of 4 | | | |
| How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits? | | | |
| 0 out of 2 | | | |
| **Blanks** | | | |
| Is a Method Blank Summary Form present? | X | | |
| Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent? | X | | |
| Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Is the chromatographic performance acceptable for each instrument? | X | | |
| Do any method/reagent/instrument blanks have positive results? | | X | |
| Do any field/rinse blanks have positive results? | | | X |
| Are there field/rinse/equipment blanks associated with every sample? | | X | |
| **Calibration and GC Performance** | | | |
| Are the following chromatograms and data printouts present? | | | |
| Aroclor 1016/1260 | X | | |
| Aroclor 1221 | X | | |
| Aroclor 1232 | X | | |
| Aroclor 1242 | X | | |
| Aroclor 1248 | X | | |
| Aroclor 1254 | X | | |
| Instrument Blanks | X | | |
| Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? | X | | |
| Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) | X | | |
| Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank? | X | | |
| Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? | X | | |
| Are %D values for all compounds within limits (less than 15%)? | X | | |
| **Analytical Sequence Check** | | | |
| Is a analytical sequence form present and complete for each column and each period of analyses? | X | | |
| Was the proper analytical sequence followed? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| **Cleanup Efficiency Verification** | | | |
| If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? | X | | |
| Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? | X | | |
| **PCB Identification** | | | |
| Is both a combined and single column Aroclor Identification Report present for every sample? | X | | |
| Do the combined column and individual column Aroclor identifications agree? | X | | |
| Were there any false negatives? | | X | |
| Was GC/MS confirmation provided when required? | | | X |
| **Compound Quantitation and Reported Detection Limits** | | | |
| Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture? | X | | |
| **Chromatogram Quality** | | | |
| Were the baselines stable? | X | | |
| Were any electronegative displacement (negative peaks) or unusual peaks detected? | | X | |
| **Field Duplicates** | | | |
| Where field duplicates submitted with the samples? | | X | |

# PCB Holding Time and Surrogate Recovery Summary

| Sample ID | Holding Time | Surrogates - Column 1 | | Surrogates - Column 2 | |
|---|---|---|---|---|---|
| | | TCX | DCB | TCX | DCB |
| K42011M | OK for all samples | | | | |
| K42012M | | | | | |
| K42014W | | ↓ (48) | | | |
| K42015W | | | | | |
| K42016W | | | | | |
| K42017M | | | | | |
| K42018M | | | | | |
| K42019W | | ↓ (37) | ↓ (37) | ↓ (50) | ↓ (50) |
| K42019WRE | | ↓ (38) | ↓ (39) | ↓ (47) | ↓ (46) |
| K42019WMS | | | | | |
| K42019WMSD | | | | | |
| K42020W | | | | | |
| K42021W | | | | | |
| K42022M | | ↓ (54) | | | |
| K42023M | | | | | |
| K42024W | | | | | |
| K42025M | | | | | |
| K42026M | | | | | |
| K42027M | | | | | |
| K42028M | | | | | |
| K42029M | | | | | |
| K42030W | | | | | |

Surrogate Standards:

TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

# PCB Calibration Summary

Instrument: HP2087
Column: RTX-35 / RTX-5

| Date: | 7/16/94 1714 | 7/18 | 7/18 | 7/19 | 7/19 | 7/19 | 7/19 |
|---|---|---|---|---|---|---|---|
| Time: | to 7/17/94 1207 | 1821 | 1855 | 0135 | 0209 | 0850 | 0923 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | 4.4 / 4.2 | | | | 0.0 | | |
| Aroclor 1221 | 2.7 / 3.5 | | | | | | |
| Aroclor 1232 | 3.9 / 3.8 | | | | | | |
| Aroclor 1242 | 4.2 / 3.9 | | | | | | 1.0 |
| Aroclor 1248 | 6.4 / 5.1 | 15.0 | | 14.5 | | 16.0 | |
| Aroclor 1254 | 4.6 / 4.2 | | | | | | |
| Aroclor 1260 | 3.8 / 3.5 | | 5.5 | | | | |
| Tetrachloro-m-xylene | 11.0 / 4.0 | | | | | | |
| Decachlorobiphenyl | 7.0 / 9.6 | | | | | | |
| Affected Samples: | | | | | | | |
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bio44286

# PCB Calibration Summary - Page 2

Instrument: HP2087
Column: RTX-35 / RTX-5

| Date: | | 7/19 | 7/19 | | | | |
|---|---|---|---|---|---|---|---|
| Time: | | 1530 | 1609 | | | | |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | | | | | | | |
| Aroclor 1221 | | | | | | | |
| Aroclor 1232 | | | | | | | |
| Aroclor 1242 | | | | | | | |
| Aroclor 1248 | | 8.0 | | | | | |
| Aroclor 1254 | | | 2.5 | | | | |
| Aroclor 1260 | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |

Affected Samples:

# PCB Calibration Summary - Page 3

Instrument: HPYYYY
Column: RTX-35 / RTX-5

| Date: | 8/10/94 0141 | 8/11 | 8/11 | 8/11 | 8/11 | 8/11 | 8/11 |
|---|---|---|---|---|---|---|---|
| Time: | to 8/10/94 23:45 | 0103 | 0142 | 0929 | 1008 | 1756 | 1838 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | 3.1 / 2.8 | | 4.0 | | | | |
| Aroclor 1221 | 4.8 / 4.7 | | | | | | |
| Aroclor 1232 | 3.9 / 4.0 | | | | | | |
| Aroclor 1242 | 3.8 / 3.7 | | | | 3.5 | | |
| Aroclor 1248 | 2.7 / 2.8 | 8.0 | | 6.0 | | 2.0 | |
| Aroclor 1254 | 3.0 / 3.4 | | | | | | 0.0 |
| Aroclor 1260 | 4.9 / 4.9 | | | | | | |
| Tetrachloro-m-xylene | 8.9 / 6.7 | | | | | | |
| Decachlorobiphenyl | 9.9 / 6.0 | | | | | | |
| Affected Samples: | | | | | | | |
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# PCB Calibration Summary - Page 4

Instrument: HPYYYY
Column: RTX-35 / RTX-5

| Date: | | 8/12 | 8/12 | 8/12 | 8/12 | | |
|---|---|---|---|---|---|---|---|
| Time: | | 0223 | 0302 | 0853 | 0932 | | |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | | | | | 3.5 | | |
| Aroclor 1221 | | | | | | | |
| Aroclor 1232 | | | | | | | |
| Aroclor 1242 | | | | | | | |
| Aroclor 1248 | | 3.0 | | 2.0 | | | |
| Aroclor 1254 | | | | | | | |
| Aroclor 1260 | | | 8.0 | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |

Affected Samples:

bio44286

# CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42011M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 221695
Date Received: 05/19/94
Date Extracted: 06/23/94
Date Analyzed: 07/18/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.11 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42012M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 221696

Date Received: 05/19/94

Date Extracted: 06/23/94

Date Analyzed: 07/18/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.15 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42014W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 25.0

Lab Sample ID: 221698
Date Received: 05/19/94
Date Extracted: 06/23/94
Date Analyzed: 07/18/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 1.2 | U |
| 11104-28-2 | Aroclor-1221 | 1.2 | U |
| 11141-16-5 | Aroclor-1232 | 1.2 | U |
| 53469-21-9 | Aroclor-1242 | 1.2 | U |
| 12672-29-6 | Aroclor-1248 | 1.2 | U |
| 11097-69-1 | Aroclor-1254 | 1.2 | U |
| 11096-82-5 | Aroclor-1260 | 7.9 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42015W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 221700

Date Received: 05/20/94

Date Extracted: 06/23/94

Date Analyzed: 07/18/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.27 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42016W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 221788
Date Received: 05/23/94
Date Extracted: 06/24/94
Date Analyzed: 07/18/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.29 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42017M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 221789

Date Received: 05/23/94

Date Extracted: 06/24/94

Date Analyzed: 07/18/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.050 | U |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42018M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 221790
Date Received: 05/23/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.024 | J |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42019W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA

Phase Weight: 10.1 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 222303

Date Received: 05/25/94

Date Extracted: 07/11/94

Date Analyzed: 07/19/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U J |
| 11104-28-2 | Aroclor-1221 | 0.050 | U J |
| 11141-16-5 | Aroclor-1232 | 0.050 | U J |
| 53469-21-9 | Aroclor-1242 | 0.050 | U J |
| 12672-29-6 | Aroclor-1248 | 0.050 | U J |
| 11097-69-1 | Aroclor-1254 | 0.050 | U J |
| 11096-82-5 | Aroclor-1260 | 0.15 | J |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42020W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 222305
Date Received: 05/25/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.097 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42021W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 222306
Date Received: 05/25/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.050 | U |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42022M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 25

Lab Sample ID: 222307

Date Received: 05/25/94

Date Extracted: 06/24/94

Date Analyzed: 07/19/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 1.2 | U |
| 11104-28-2 | Aroclor-1221 | 1.2 | U |
| 11141-16-5 | Aroclor-1232 | 1.2 | U |
| 53469-21-9 | Aroclor-1242 | 1.2 | U |
| 12672-29-6 | Aroclor-1248 | 1.2 | U |
| 11097-69-1 | Aroclor-1254 | 1.2 | U |
| 11096-82-5 | Aroclor-1260 | 8.1 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42023M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 222353
Date Received: 05/26/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.038 | J |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42024W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 222354
Date Received: 05/26/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.26 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42025M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 222410

Date Received: 05/27/94

Date Extracted: 06/24/94

Date Analyzed: 07/19/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.021 | J |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42026M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 222411
Date Received: 05/27/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.044 | J |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42027W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 222412
Date Received: 05/27/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.49 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42028M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 222413

Date Received: 05/27/94

Date Extracted: 06/24/94

Date Analyzed: 07/19/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.24 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42029M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 222414
Date Received: 05/27/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.050 | U |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42030W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44286

Phase Type: BIOTA

Phase Weight: 10.2 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 222615

Date Received: 05/28/94

Date Extracted: 07/11/94

Date Analyzed: 08/11/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.049 | U |
| 11104-28-2 | Aroclor-1221 | 0.049 | U |
| 11141-16-5 | Aroclor-1232 | 0.049 | U |
| 53469-21-9 | Aroclor-1242 | 0.049 | U |
| 12672-29-6 | Aroclor-1248 | 0.049 | U |
| 11097-69-1 | Aroclor-1254 | 0.049 | U |
| 11096-82-5 | Aroclor-1260 | 0.27 | |
| | | | |

% LIPIDS

% LIPIDS

| Sample ID | Description | % Lipid[1] |
|---|---|---|
| K42011M | Below Allegan Dam - snapping turtle | 0.04 |
| K42012M | Below Allegan Dam - snapping turtle | 0.04 |
| K42014W | Below Allegan Dam - snapping turtle | 5.5 |
| K42015W | Battle Creek - snapping turtle | 5.68 |
| K42016W | Battle Creek - snapping turtle | 3.62 |
| K42017M | Battle Creek - snapping turtle | 0.18 |
| K42018M | Battle Creek - snapping turtle | 0.10 |
| K42019W | Battle Creek - snapping turtle | 0.05 |
| K42020W | Below Allegan Dam - snapping turtle | 0.58 |
| K42021W | Below Allegan Dam - snapping turtle | 4.9 |
| K42022M | Battle Creek - snapping turtle | 0.34 |
| K42023M | Battle Creek - snapping turtle | 0.15 |
| K42024W | Battle Creek - snapping turtle | 1.70 |
| K42025M | Battle Creek - snapping turtle | 0.17 |
| K42026M | Battle Creek - snapping turtle | 0.08 |
| K42027M | Battle Creek - snapping turtle | 1.10 |
| K42028M | Allegan Dam - snapping turtle | 0.10 |
| K42029M | Allegan Dam - snapping turtle | 0.10 |
| K42030W | Plainwell Dam - snapping turtle | 4.18 |

1 Lipid results are expressed in %w/w

# DATA REVIEW FOR

# ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

## SDG# 44496

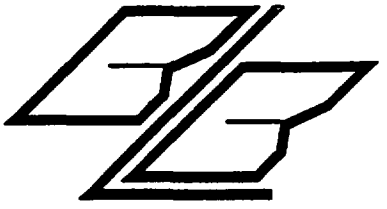
## PCB ANALYSES

## BIOTA - TURTLES

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

## Summary

The following is an assessment of the PCB data package for SDG # 44496 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and lipids analyses. Analyses were performed on the following samples:

| Sample ID | Lab ID | Matrix | Description | Sample Location | Date of Collection |
|---|---|---|---|---|---|
| K42031M | 222616 | turtle | whole body | Allegan Dam | 5/26/94 |
| K42032W | 222617 | turtle | whole body | Allegan Dam | 5/27/94 |
| K42033M | 222796 | turtle | muscle | Below Allegan Dam | 6/1/94 |
| K42034M | 222797 | turtle | muscle | Below Allegan Dam | 6/1/94 |
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# PCB ANALYSES

## Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

E The compound was quantitated above the calibration range.

D Concentration is based on a diluted sample analysis.

UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

1. Holding Time

There is no specified holding time to extraction for PCBs in biota samples. The specified holding time for PCB analysis is 40 days from extraction. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in the method blanks or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits with the following exception:

HP2087 7/19/94 08:50

Aroclor 1248 16.0%

Since the %D for the continuing calibration standard (Aroclor 1242) run with the standard was within acceptable limits and since no Aroclor 1248 was detected in any of the associated samples, no qualifiers have been added to the data based on the deviation.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K42031W and K42032W. All other surrogate recoveries were within acceptable control limits. No qualifiers have been added to the samples based on surrogate performance.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

No matrix spike and matrix spike samples were included in this sample delivery group. The associated matrix spike and matrix spike duplicate analyses can be found in SDG# 44286.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

# DATA REVIEW CHECKLIST

PCB Data Review Checklist

| | YES | NO | NA |
|---|---|---|---|
| **Data Completeness and Deliverables** | | | |
| Is there a narrative or cover letter present? | X | | |
| Are the samples numbers included in the narrative? | X | | |
| Are the sample chain-of-custodies present? | X | | |
| Do the chain-of-custodies indicate any problems with sample receipt or sample condition? | | X | |
| **Holding Times** | | | |
| Have any holding times been exceeded? | | X | |
| **Surrogate Recovery** | | | |
| Are surrogate recovery forms present? | X | | |
| Are all the samples listed on the appropriate surrogate recovery form? | X | | |
| Are the outliers correctly marked with an asterisk? | X | | |
| Were recoveries of TCMX or DCB outside of specified limits for any sample or blank? | X | | |
| If yes, were the samples reanalyzed? | | X | |
| **Matrix Spikes** | | | |
| Is there a matrix spike recovery form present? | | X | |
| Were matrix spikes analyzed at the required frequency? | X | | |
| How many spike recoveries were outside of QC limits? | | | |
| 0 out of 0 | | | |
| How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits? | | | |
| 0 out of 0 | | | |
| **Blanks** | | | |
| Is a Method Blank Summary Form present? | X | | |
| Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent? | X | | |
| Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Is the chromatographic performance acceptable for each instrument? | X | | |
| Do any method/reagent/instrument blanks have positive results? | | X | |
| Do any field/rinse blanks have positive results? | | | X |
| Are there field/rinse/equipment blanks associated with every sample? | | X | |
| **Calibration and GC Performance** | | | |
| Are the following chromatograms and data printouts present? | | | |
| Aroclor 1016/1260 | X | | |
| Aroclor 1221 | X | | |
| Aroclor 1232 | X | | |
| Aroclor 1242 | X | | |
| Aroclor 1248 | X | | |
| Aroclor 1254 | X | | |
| Instrument Blanks | X | | |
| Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? | X | | |
| Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) | X | | |
| Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank? | X | | |
| Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? | X | | |
| Are %D values for all compounds within limits (less than 15%)? | X | | |
| **Analytical Sequence Check** | | | |
| Is a analytical sequence form present and complete for each column and each period of analyses? | X | | |
| Was the proper analytical sequence followed? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| **Cleanup Efficiency Verification** | | | |
| If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? | X | | |
| Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? | X | | |
| **PCB Identification** | | | |
| Is both a combined and single column Aroclor Identification Report present for every sample? | X | | |
| Do the combined column and individual column Aroclor identifications agree? | X | | |
| Were there any false negatives? | | X | |
| Was GC/MS confirmation provided when required? | | | X |
| **Compound Quantitation and Reported Detection Limits** | | | |
| Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture? | X | | |
| **Chromatogram Quality** | | | |
| Were the baselines stable? | X | | |
| Were any electronegative displacement (negative peaks) or unusual peaks detected? | | X | |
| **Field Duplicates** | | | |
| Where field duplicates submitted with the samples? | | X | |

# PCB Holding Time and Surrogate Recovery Summary

| Sample ID | Holding Time | Surrogates - Column 1 | | Surrogates - Column 2 | |
|---|---|---|---|---|---|
| | | TCX | DCB | TCX | DCB |
| K42031W | OK for all samples | ↓ (51) | ok | ↓ (47) | ok |
| K42032W | | ↓ (59) | | ↓ (57) | |
| K42033M | | | | | |
| K42034M | | | | | |
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Surrogate Standards:

TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

# PCB Calibration Summary

Instrument: HP2087
Column: RTX-35 / RTX-5

| Date: | 7/16/94 1714 | 7/18 | 7/18 | 7/19 | 7/19 | 7/19 | 7/19 |
|---|---|---|---|---|---|---|---|
| Time: | to 7/17/94 1207 | 1821 | 1855 | 0135 | 0209 | 0850 | 0923 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | 4.4 / 4.2 | | | | 0.0 | | |
| Aroclor 1221 | 2.7 / 3.5 | | | | | | |
| Aroclor 1232 | 3.9 / 3.8 | | | | | | |
| Aroclor 1242 | 4.2 / 3.9 | | | | | | 1.0 |
| Aroclor 1248 | 6.4 / 5.1 | 15.0 | | 14.5 | | 16.0 | |
| Aroclor 1254 | 4.6 / 4.2 | | | | | | |
| Aroclor 1260 | 3.8 / 3.5 | | 5.5 | | | | |
| Tetrachloro-m-xylene | 11.0 / 4.0 | | | | | | |
| Decachlorobiphenyl | 7.0 / 9.6 | | | | | | |

Affected Samples:

# PCB Calibration Summary - Page 2

Instrument: HPYYYY
Column: RTX-35 / RTX-5

| Date: | 8/10/94 0141 | 8/11 | 8/11 | 8/11 | 8/11 | 8/11 | 8/11 |
|---|---|---|---|---|---|---|---|
| Time: | to 8/10/94 2345 | 0103 | 0142 | 0929 | 1008 | 1756 | 1835 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | 3.1 / 2.8 | - | 4.0 | | | | |
| Aroclor 1221 | 4.8 / 4.7 | | | | | | |
| Aroclor 1232 | 3.9 / 4.0 | | | | | | |
| Aroclor 1242 | 3.8 / 3.7 | | | | 3.5 | | |
| Aroclor 1248 | 2.7 / 2.8 | 8.0 | | 6.0 | | 2.0 | |
| Aroclor 1254 | 3.0 / 3.4 | | | | | | 0.0 |
| Aroclor 1260 | 4.9 / 4.9 | | | | | | |
| Tetrachloro-m-xylene | 8.8 / 6.7 | | | | | | |
| Decachlorobiphenyl | 9.9 / 6.0 | | | | | | |
| Affected Samples: | | | | | | | |
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# PCB Calibration Summary - Page 3

Instrument: HPYYYY
Column: RTX-35 / RTX-5

| Date: | | 8/12 | 8/12 | 8/12 | 8/12 | | |
|---|---|---|---|---|---|---|---|
| Time: | | 0223 | 0302 | 0853 | 0932 | | |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | | | | | 3.5 | | |
| Aroclor 1221 | | | | | | | |
| Aroclor 1232 | | | | | | | |
| Aroclor 1242 | | | | | | | |
| Aroclor 1248 | | 3.0 | | 2.0 | | | |
| Aroclor 1254 | | | | | | | |
| Aroclor 1260 | | | 8.0 | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |

Affected Samples:

# CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42031W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44496

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 222616

Date Received: 05/28/94

Date Extracted: 07/11/94

Date Analyzed: 08/11/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.53 | |
| 11096-82-5 | Aroclor-1260 | 0.72 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42032W

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44496

Phase Type: BIOTA

Phase Weight: 10.1 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 222617

Date Received: 05/28/94

Date Extracted: 07/11/94

Date Analyzed: 08/12/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.50 | U |
| 11104-28-2 | Aroclor-1221 | 0.50 | U |
| 11141-16-5 | Aroclor-1232 | 0.50 | U |
| 53469-21-9 | Aroclor-1242 | 0.50 | U |
| 12672-29-6 | Aroclor-1248 | 0.50 | U |
| 11097-69-1 | Aroclor-1254 | 0.50 | U |
| 11096-82-5 | Aroclor-1260 | 2.6 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42033M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44496

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 222796
Date Received: 06/02/94
Date Extracted: 06/24/94
Date Analyzed: 07/19/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.25 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K42034M

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 44496

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 222797

Date Received: 06/02/94

Date Extracted: 06/24/94

Date Analyzed: 07/19/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.050 | U |
| 11096-82-5 | Aroclor-1260 | 0.11 | |
| | | | |

% LIPIDS

## % LIPIDS

| Sample ID | Description | % Lipid[1] |
|---|---|---|
| K42031M | Allegan Dam - Snapping Turtle | 1.25 |
| K42032W | Allegan Dam - Snapping Turtle | 1.25 |
| K42033M | Below Allegan Dam - Snapping Turtle | 0.17 |
| K42034M | Below Allegan Dam - Snapping Turtle | 0.07 |

1 Lipid results are expressed in %w/w

# Appendix E

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# 39023

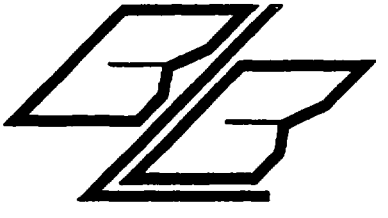
PCB, PESTICIDE AND
MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

## Summary

The following is an assessment of the pesticide/PCB/PBB and mercury data for SDG# 39023 of the biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and the qualified sample results. Analyses were performed on the following samples:

| Sample ID | Lab ID | Species | Description | Sample Location | Analysis | |
|---|---|---|---|---|---|---|
| | | | | | PCB/Pest/ Hg | %lipid |
| K40001F | 208251 | carp | Fillet | Morrow Pond | x | x |
| K40001R | 208252 | carp | Carcass | Morrow Pond | | x |
| K40002F | 208253 | carp | Fillet | Morrow Pond | x | x |
| K40002R | 208254 | carp | Carcass | Morrow Pond | | x |
| K40003F | 208255 | carp | Fillet | Morrow Pond | x | x |
| K40003R | 208256 | carp | Carcass | Morrow Pond | | x |
| K40004F | 208257 | carp | Fillet | Morrow Pond | x | x |
| K40004R | 208258 | carp | Carcass | Morrow Pond | | x |
| K40005F | 208259 | carp | Fillet | Morrow Pond | x | x |
| K40005R | 208260 | carp | Carcass | Morrow Pond | | x |
| K40006F | 208261 | carp | Fillet | Morrow Pond | X | x |
| K40006R | 208262 | carp | Carcass | Morrow Pond | | x |
| K40007F | 208263 | carp | Fillet | Morrow Pond | x | x |
| K40007R | 208264 | carp | Carcass | Morrow Pond | | x |
| K40008F | 208265 | carp | Fillet | Morrow Pond | x | x |
| K40008R | 208266 | carp | Carcass | Morrow Pond | | x |
| K40009F | 208267 | carp | Fillet | Morrow Pond | x | x |
| K40009R | 208268 | carp | Carcass | Morrow Pond | | x |
| K40010F | 208269 | carp | Fillet | Morrow Pond | x | x |
| K40010R | 208270 | carp | Carcass | Morrow Pond | | x |
| K40011F* | 208271 | carp | Fillet | Below Morrow Pond | x | x |
| K40011R | 208272 | carp | Carcass | Below Morrow Pond | | x |
| K40034F | 208276 | carp | Fillet | Below Morrow Pond | x | x |
| K40034R | 208277 | carp | Carcass | Below Morrow Pond | | x |
| K40035F | 208278 | carp | Fillet | Below Morrow Pond | x | x |
| K40035R | 208279 | carp | Carcass | Below Morrow Pond | | x |
| K40036F | 208280 | carp | Fillet | Below Morrow Pond | x | x |
| K40036R | 208281 | carp | Carcass | Below Morrow Pond | | x |

| Sample ID | Lab ID | Species | Description | Sample Location | Analysis | |
|---|---|---|---|---|---|---|
| | | | | | PCB/Pest/ Hg | %lipid |
| K40037F | 208282 | carp | Fillet | Below Morrow Pond | x | x |
| K40037R | 208283 | carp | Carcass | Below Morrow Pond | | x |
| K40038F | 208284 | carp | Fillet | Below Morrow Pond | x | x |
| K40038R | 208285 | carp | Carcass | Below Morrow Pond | | x |
| K40039F | 208286 | carp | Fillet | Below Morrow Pond | x | x |
| K40039R | 208287 | carp | Carcass | Below Morrow Pond | | x |
| K40040F | 208288 | carp | Fillet | Below Morrow Pond | x | x |
| K40040R | 208289 | carp | Carcass | Below Morrow Pond | | x |
| K40041F | 208290 | carp | Fillet | Below Morrow Pond | x | x |
| K40041R | 208291 | carp | Carcass | Below Morrow Pond | | x |
| K40042F | 208292 | carp | Fillet | Below Morrow Pond | x | x |
| K40042R | 208293 | carp | Carcass | Below Morrow Pond | | x |

* MS/MSD/DUP performed on sample

# PCB ANALYSES

## Introduction

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During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

E The compound was quantitated above the calibration range.

D Concentration is based on a diluted sample analysis.

UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

1. Holding Time

There is no specified holding time from collection to extraction for PCB analysis of biota samples. The specified holding time from extraction to analysis is, however, 40 days. All samples were analyzed within this specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the instrument blanks. Aroclors 1016 and 1242 were detected in method blank PBLKAP and PBLKAH respectively. These compounds were not detected in any of the associated samples; therefore, no qualifiers were added to the data.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Surrogate recoveries were below acceptable control limits for one surrogate on both columns in sample K40039F. No qualifiers were added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike recoveries and relative percent differences (RPD) between recoveries were within acceptable control limits. All matrix spike blank recoveries were also within specified control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

# DATA REVIEW CHECKLIST

PCB Data Review Checklist

| | YES | NO | NA |
|---|---|---|---|
| **Data Completeness and Deliverables** | | | |
| Is there a narrative or cover letter present? | X | | |
| Are the samples numbers included in the narrative? | X | | |
| Are the sample chain-of-custodies present? | X | | |
| Do the chain-of-custodies indicate any problems with sample receipt or sample condition? | | X | |
| **Holding Times** | | | |
| Have any holding times been exceeded? | | X | |
| **Surrogate Recovery** | | | |
| Are surrogate recovery forms present? | X | | |
| Are all the samples listed on the appropriate surrogate recovery form? | X | | |
| Are the outliers correctly marked with an asterisk? | X | | |
| Were recoveries of TCMX or DCB outside of specified limits for any sample or blank? | X | | |
| *If yes, were the samples reanalyzed?* | | X | |
| **Matrix Spikes** | | | |
| Is there a matrix spike recovery form present? | X | | |
| Were matrix spikes analyzed at the required frequency? | X | | |
| How many spike recoveries were outside of QC limits? | | | |
| 0 out of 4 | | | |
| How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits? | | | |
| 0 out of 2 | | | |
| **Blanks** | | | |
| Is a Method Blank Summary Form present? | X | | |
| Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent? | X | | |
| Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Is the chromatographic performance acceptable for each instrument? | X | | |
| Do any method/reagent/instrument blanks have positive results? | X | | |
| Do any field/rinse blanks have positive results? | | | X |
| Are there field/rinse/equipment blanks associated with every sample? | | X | |
| **Calibration and GC Performance** | | | |
| Are the following chromatograms and data printouts present? | | | |
| Aroclor 1016/1260 | X | | |
| Aroclor 1221 | X | | |
| Aroclor 1232 | X | | |
| Aroclor 1242 | X | | |
| Aroclor 1248 | X | | |
| Aroclor 1254 | X | | |
| Instrument Blanks | X | | |
| Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? | X | | |
| Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) | X | | |
| Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank? | X | | |
| Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? | X | | |
| Are %D values for all compounds within limits (less than 15%)? | X | | |
| **Analytical Sequence Check** | | | |
| Is a analytical sequence form present and complete for each column and each period of analyses? | X | | |
| Was the proper analytical sequence followed? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| **Cleanup Efficiency Verification** | | | |
| If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? | X | | |
| Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? | X | | |
| **PCB Identification** | | | |
| Is both a combined and single column Aroclor Identification Report present for every sample? | X | | |
| Do the combined column and individual column Aroclor identifications agree? | X | | |
| Were there any false negatives? | | X | |
| Was GC/MS confirmation provided when required? | | | X |
| **Compound Quantitation and Reported Detection Limits** | | | |
| Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture? | X | | |
| ***Chromatogram Quality*** | | | |
| Were the baselines stable? | X | | |
| Were any electronegative displacement (negative peaks) or unusual peaks detected? | | X | |
| **Field Duplicates** | | | |
| Where field duplicates submitted with the samples? | | X | |

## PCB Holding Time and Surrogate Recovery Summary

| Sample ID | Holding Time | Surrogates - Column 1 | | Surrogates - Column 2 | |
|---|---|---|---|---|---|
| | | TCX | DCB | TCX | DCB |
| K40001F | OK for all samples | | | | |
| K40002F | | | | | |
| K40003F | | | | | |
| K40004F | | | | | |
| K40005F | | | | | |
| K40006F | | | | | |
| K40007F | | | | | |
| K40008F | | | | | |
| K40009F | | | | | |
| K40010F | | | | | |
| K40011F | | | | | |
| K40011FMS | | | | | |
| K40011FMSD | | | | | |
| K40034F | | | | | |
| K40035F | | | | | |
| K40036F | | | | | |
| K40037F | | | | | |
| P40038F | | | | | |
| P40039F | | ↓ (58) | | ↓ (58) | |
| P40040F | | | | | |
| P40041F | | | | | |
| P40042F | | | | | |

Surrogate Standards
TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:
D Surrogates diluted out
↑ Recovery high
↓ Recovery low

*Unless otherwise noted, all parameters are within specified limits.*

# PCB Calibration Summary

Instrument: HP2618
Column: RTX-35 / RTX-5

| Date: | 4/30/94 0543 | 5/1 | 5/1 | 5/1 | 5/1 | 5/2 | 5/2 |
|---|---|---|---|---|---|---|---|
| Time: | to 5/1/94 0166 | 0939 | 1013 | 1785 | 1740 | 0031 | 0106 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | 4.2 / 4.4 | | | | | | |
| Aroclor 1221 | 5.1 / 6.9 | | | | | | |
| Aroclor 1232 | 4.2 / 3.1 | | | | | | |
| Aroclor 1242 | 3.1 / 3.4 | | 11.5 | | | | |
| Aroclor 1248 | 3.4 / 3.0 | 10.0 | | 5.0 | | 2.5 | |
| Aroclor 1254 | 3.1 / 3.6 | | | | 0.0 | | |
| Aroclor 1260 | 3.8 / 3.4 | | | | | | 1.0 |
| Tetrachloro-m-xylene | 5.2 / 6.4 | | | | | | |
| Decachlorobiphenyl | 7.9 / 8.1 | | | | | | |
| Affected Samples: | | | | | | | |
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# PCB Calibration Summary - Page 2

Instrument: HP2618
Column: RTX-35 / RTX-5

| Date: | | 5/2 | 5/2 | 5/3 | 5/3 | 5/3 | 5/3 |
|---|---|---|---|---|---|---|---|
| Time: | | 0957 | 0431 | 1942 | 1416 | 2100 | 2143 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | | | 12.5 | | | | |
| Aroclor 1221 | | | | | | | |
| Aroclor 1232 | | | | | | | |
| Aroclor 1242 | | | | | 1.5 | | |
| Aroclor 1248 | | 1.0 | | 3.0 | | 4.0 | |
| Aroclor 1254 | | | | | | | 7.5 |
| Aroclor 1260 | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |

Affected Samples:

# PCB Calibration Summary - Page 3

Instrument: HP2618
Column: RTX-35 / RTX-5

| Date: | | 5/3 | 5/3 | | | | |
|---|---|---|---|---|---|---|---|
| Time: | | 0434 | 0509 | | | | |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| Aroclor 1016 | | | | | | | |
| Aroclor 1221 | | | | | | | |
| Aroclor 1232 | | | | | | | |
| Aroclor 1242 | | | | | | | |
| Aroclor 1248 | | 3.5 | | | | | |
| Aroclor 1254 | | | | | | | |
| Aroclor 1260 | | | 8.0 | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |

Affected Samples:

bio39023

# CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40001F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 2.0

Lab Sample ID: 208251

Date Received: 08/26/94

Date Extracted: 03/26/94

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.10 | U |
| 11104-28-2 | Aroclor-1221 | 0.10 | U |
| 11141-16-5 | Aroclor-1232 | 0.10 | U |
| 53469-21-9 | Aroclor-1242 | 0.10 | U |
| 12672-29-6 | Aroclor-1248 | 0.10 | U |
| 11097-69-1 | Aroclor-1254 | 0.91 | |
| 11096-82-5 | Aroclor-1260 | 0.21 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40002F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 208253

Date Received: 08/26/94

Date Extracted: 03/26/94

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.23 | |
| 11096-82-5 | Aroclor-1260 | 0.19 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40003F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 208255

Date Received: 08/26/94

Date Extracted: 03/26/94

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.14 | |
| 11096-82-5 | Aroclor-1260 | 0.20 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40004F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 208257

Date Received: 08/26/94

Date Extracted: 03/26/94

Date Analyzed: 05/01/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.16 | |
| 11096-82-5 | Aroclor-1260 | 0.29 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40005F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 208259
Date Received: 08/26/94
Date Extracted: 03/26/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.26 | |
| 11096-82-5 | Aroclor-1260 | 0.37 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40006F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 208261

Date Received: 08/26/94

Date Extracted: 03/26/94

Date Analyzed: 05/01/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.25 | |
| 11096-82-5 | Aroclor-1260 | 0.10 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40007F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 208263
Date Received: 08/26/94
Date Extracted: 03/26/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.16 | |
| 11096-82-5 | Aroclor-1260 | 0.14 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40008F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Lab Sample ID: 208265

Date Received: 08/26/94

Date Extracted: 03/26/94

Date Analyzed: 05/01/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.71 | |
| 11096-82-5 | Aroclor-1260 | 0.29 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40009F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 5.0

Lab Sample ID: 208267

Date Received: 08/26/94

Date Extracted: 03/26/94

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.25 | U |
| 11104-28-2 | Aroclor-1221 | 0.25 | U |
| 11141-16-5 | Aroclor-1232 | 0.25 | U |
| 53469-21-9 | Aroclor-1242 | 0.25 | U |
| 12672-29-6 | Aroclor-1248 | 0.25 | U |
| 11097-69-1 | Aroclor-1254 | 1.5 | |
| 11096-82-5 | Aroclor-1260 | 0.40 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40010F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 208269
Date Received: 08/26/94
Date Extracted: 03/26/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.055 | |
| 11096-82-5 | Aroclor-1260 | 0.028 | J |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40011F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 1.0

Lab Sample ID: 208271
Date Received: 08/26/94
Date Extracted: 03/26/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.050 | U |
| 11104-28-2 | Aroclor-1221 | 0.050 | U |
| 11141-16-5 | Aroclor-1232 | 0.050 | U |
| 53469-21-9 | Aroclor-1242 | 0.050 | U |
| 12672-29-6 | Aroclor-1248 | 0.050 | U |
| 11097-69-1 | Aroclor-1254 | 0.12 | |
| 11096-82-5 | Aroclor-1260 | 0.048 | J |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40034F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 10.0

Lab Sample ID: 208276
Date Received: 08/28/94
Date Extracted: 03/29/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.50 | U |
| 11104-28-2 | Aroclor-1221 | 0.50 | U |
| 11141-16-5 | Aroclor-1232 | 0.50 | U |
| 53469-21-9 | Aroclor-1242 | 0.50 | U |
| 12672-29-6 | Aroclor-1248 | 0.50 | U |
| 11097-69-1 | Aroclor-1254 | 5.9 | |
| 11096-82-5 | Aroclor-1260 | 1.6 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40035F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 2.0

Lab Sample ID: 208278
Date Received: 08/28/94
Date Extracted: 03/29/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.10 | U |
| 11104-28-2 | Aroclor-1221 | 0.10 | U |
| 11141-16-5 | Aroclor-1232 | 0.10 | U |
| 53469-21-9 | Aroclor-1242 | 0.10 | U |
| 12672-29-6 | Aroclor-1248 | 0.10 | U |
| 11097-69-1 | Aroclor-1254 | 1.0 | |
| 11096-82-5 | Aroclor-1260 | 0.40 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40036F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 10.0

Lab Sample ID: 208280
Date Received: 08/28/94
Date Extracted: 03/29/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.50 | U |
| 11104-28-2 | Aroclor-1221 | 0.50 | U |
| 11141-16-5 | Aroclor-1232 | 0.50 | U |
| 53469-21-9 | Aroclor-1242 | 0.50 | U |
| 12672-29-6 | Aroclor-1248 | 0.50 | U |
| 11097-69-1 | Aroclor-1254 | 7.1 | |
| 11096-82-5 | Aroclor-1260 | 1.1 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40037F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 5.0

Lab Sample ID: 208282
Date Received: 08/28/94
Date Extracted: 03/29/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.25 | U |
| 11104-28-2 | Aroclor-1221 | 0.25 | U |
| 11141-16-5 | Aroclor-1232 | 0.25 | U |
| 53469-21-9 | Aroclor-1242 | 0.25 | U |
| 12672-29-6 | Aroclor-1248 | 0.25 | U |
| 11097-69-1 | Aroclor-1254 | 2.7 | |
| 11096-82-5 | Aroclor-1260 | 0.34 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40038F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 5.0

Lab Sample ID: 208284
Date Received: 08/28/94
Date Extracted: 03/29/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.25 | U |
| 11104-28-2 | Aroclor-1221 | 0.25 | U |
| 11141-16-5 | Aroclor-1232 | 0.25 | U |
| 53469-21-9 | Aroclor-1242 | 0.25 | U |
| 12672-29-6 | Aroclor-1248 | 0.25 | U |
| 11097-69-1 | Aroclor-1254 | 3.1 | |
| 11096-82-5 | Aroclor-1260 | 1.0 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40039F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 10.0

Lab Sample ID: 208286

Date Received: 08/28/94

Date Extracted: 03/29/94

Date Analyzed: 05/01/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.50 | U |
| 11104-28-2 | Aroclor-1221 | 0.50 | U |
| 11141-16-5 | Aroclor-1232 | 0.50 | U |
| 53469-21-9 | Aroclor-1242 | 0.50 | U |
| 12672-29-6 | Aroclor-1248 | 0.50 | U |
| 11097-69-1 | Aroclor-1254 | 6.2 | |
| 11096-82-5 | Aroclor-1260 | 1.1 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40040F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 5.0

Lab Sample ID: 208288

Date Received: 08/28/94

Date Extracted: 03/29/94

Date Analyzed: 05/01/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.25 | U |
| 11104-28-2 | Aroclor-1221 | 0.25 | U |
| 11141-16-5 | Aroclor-1232 | 0.25 | U |
| 53469-21-9 | Aroclor-1242 | 0.25 | U |
| 12672-29-6 | Aroclor-1248 | 0.25 | U |
| 11097-69-1 | Aroclor-1254 | 3.5 | |
| 11096-82-5 | Aroclor-1260 | 0.76 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40041F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 5.0

Lab Sample ID: 208290
Date Received: 08/28/94
Date Extracted: 03/29/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.25 | U |
| 11104-28-2 | Aroclor-1221 | 0.25 | U |
| 11141-16-5 | Aroclor-1232 | 0.25 | U |
| 53469-21-9 | Aroclor-1242 | 0.25 | U |
| 12672-29-6 | Aroclor-1248 | 0.25 | U |
| 11097-69-1 | Aroclor-1254 | 3.1 | |
| 11096-82-5 | Aroclor-1260 | 0.30 | |
| | | | |

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40042F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39023

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 5.0

Lab Sample ID: 208292

Date Received: 08/28/94

Date Extracted: 03/31/94

Date Analyzed: 05/02/94

Sulfur Clean-up: N (Y/N)

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | 0.25 | U |
| 11104-28-2 | Aroclor-1221 | 0.25 | U |
| 11141-16-5 | Aroclor-1232 | 0.25 | U |
| 53469-21-9 | Aroclor-1242 | 0.25 | U |
| 12672-29-6 | Aroclor-1248 | 0.25 | U |
| 11097-69-1 | Aroclor-1254 | 2.9 | |
| 11096-82-5 | Aroclor-1260 | 0.35 | |
| | | | |

# PESTICIDE ANALYSES

## Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

E The compound was quantitated above the calibration range.

D Concentration is based on a diluted sample analysis.

C Identification confirmed by GC/MS.

UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

# Data Assessment

## 1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

## 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

## 3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

## 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

### 4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

### 4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries was low for one surrogate in sample K40034F-DL. No qualifiers have been added to this sample based on the recovery. All other surrogate recoveries were within acceptable limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

| | | |
|---|---|---|
| K40001F | gamma-Chlordane | 78.2% |
| | trans-Nonachlor | 136.0% |
| K40006F | 4,4'-DDE | 35.7% |
| K40008F | trans-Nonachlor | 72.4% |
| K40009F | Aldrin | 33.3% |
| | gamma-Chlordane | 66.7% |
| | trans-Nonachlor | 135.3% |
| | Dieldrin | 125.0% |
| K40034F | gamma-BHC | 47.5% |
| | Aldrin | 75.0% |
| | gamma-Chlordane | 80.0% |
| | alpha-Chlordane | 36.4% |
| | trans-Nonachlor | 216.0% |
| | cis-Nonachlor | 57.4% |
| K40034F-DL | gamma-Chlordane | 87.0% |
| | 4,4'-DDE | 38.9% |
| K40035F | Aldrin | 63.6% |
| | gamma-Chlordane | 112.1% |
| | trans-Nonachlor | 240.0% |
| | cis-Nonachlor | 35.7% |
| K40036F | Aldrin | 59.5% |
| | Dieldrin | 185.7% |
| | 4,4'-DDT | 773.2% |

| | | |
|---|---|---|
| K40037F | Aldrin | 63.6% |
| | Heptachlor epoxide | 35.0% |
| | gamma-Chlordane | 84.2% |
| | 4,4'-DDT | 773.2% |
| K40038F | Aldrin | 73.3% |
| | Heptachlor epoxide | 62.2% |
| | gamma-Chlordane | 164.3% |
| | 4,4'-DDE | 26.3% |
| | Dieldrin | 46.2% |
| | 4,4'-DDT | 845.9% |
| P40039F | Aldrin | 43.8% |
| | Heptachlor epoxide | 27.3% |
| | gamma-Chlordane | 83.8% |
| | trans-Nonachlor | 293.9% |
| | Dieldrin | 160.0% |
| | 4,4'-DDT | 775.0% |
| K40040F | Aldrin | 91.7% |
| | gamma-Chlordane | 81.3% |
| | Dieldrin | 53.3% |
| K40041F | Aldrin | 35.0% |
| | gamma-Chlordane | 65.5% |
| | trans-Nonachlor | 192.3% |
| | Dieldrin | 120.8% |
| K40042F | Aldrin | 42.1% |
| | gamma-Chlordane | 83.3% |
| | trans-Nonachlor | 205.3% |
| | 4,4'-DDE | 28.6% |
| | Dieldrin | 90.5% |
| | 4,4'-DDT | 669.2% |

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries for Aldrin were high in both the matrix spike and matrix spike duplicate samples. The elevated recoveries were most likely due to positive interference from PCBs present in the samples. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers were added to the samples based on matrix spike performance.

8. General Comments

The recommended data usage for the sample dilution is as follows:

K40034F and K40034F-DL

The data from sample K40034F should be used for all compounds except 4,4'-DDE. The data from the diluted analysis K40034F-DL should be used for 4,4'-DDE only.

9 System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

# Data Validation Checksheets

# Pesticide Data Validation Checklist

| | YES | NO | NA |
|---|---|---|---|
| **Data Completeness and Deliverables** | | | |
| Is there a narrative or cover letter present? | X | | |
| Are the samples numbers included in the narrative? | X | | |
| Are the sample chain-of-custodies present? | X | | |
| Do the chain-of-custodies indicate any problems with sample receipt or sample condition? | | X | |
| **Holding Times** | | | |
| Have any holding times been exceeded? | | X | |
| **Surrogate Recovery** | | | |
| Are the surrogate recovery forms present? | X | | |
| Are all the samples listed on the appropriate surrogate recovery form? | X | | |
| Are the outliers correctly marked with an asterisk? | X | | |
| Were recoveries of TCMX or DCB outside of specified limits for any sample or blank? | X | | |
| If yes, were the samples reanalyzed? | | X | |
| Were the method blanks reanalyzed? | | | X |
| **Matrix Spikes** | | | |
| Is there a matrix spike recovery form present? | X | | |
| Were matrix spikes analyzed at the required frequency? | X | | |
| How many spike recoveries were outside of QC limits? | | | |
| 2 out of 8 | | | |
| How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits? | | | |
| 0 out of 4 | | | |
| **Blanks** | | | |
| Is the method blank summary form present? | X | | |
| Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent? | X | | |
| Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Is the chromatographic performance acceptable for each instrument? | X | | |
| Do any method/reagent/instrument blanks have positive results? | | X | |
| Do any trip/field/rinse blanks have positive results? | | | X |
| Are there field/rinse/equipment blanks associated with every sample? | | X | |
| **Calibration and GC Performance** | | | |
| Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD? | | | |
| peak resolution check | X | | |
| performance evaluation mixtures (BCS) | X | | |
| Toxaphene multipoint calibration | X | | |
| Pesticide/PBB multipoint calibration | X | | |
| Pesticide/PBB mid-point standard | X | | |
| instrument blanks | X | | |
| Are Forms VI 1-4 present and complete for each column and analytical sequence? | X | | |
| Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns? | X | | |
| Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns? | X | | |
| Is Form VII-1 present for each BCS analyzed for both columns? | X | | |
| Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT | | X | |
| Are all the relative percent difference (RPD) values for all PEM analytes < 25%? | X | | |
| Is Form VII-2 present and complete for each mid-point standard analyzed? | X | | |
| Are RPD values for all compounds < 25%? | X | | |
| **Analytical Sequence Check** | | | |
| Is Form VIII present and complete for each column and each period of analyses? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Was the proper analytical sequence followed? | X | | |
| **Cleanup Efficiency Verification** | | | |
| Is Form IX-1 present for each lot of Florisil cartridges used? | X | | |
| Are all samples listed on the form? | X | | |
| If GPC cleanup was performed, is Form IX-2 present? | | | X |
| Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for: | | | |
| Florisil cartridge check (80-120%) | X | | |
| GPC calibration (80-110%) | | | X |
| **Pesticide/PBB Identification** | | | |
| Is a Form X present for every sample in which a pesticide or PCB was detected? | X | | |
| Was GC/MS confirmation provided when required? | | | X |
| Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%? | | X | |
| Were there any false negatives? | | X | |
| **Compound Quantitation and Reported Detection Limits** | | | |
| Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture? | X | | |
| **Chromatogram Quality** | | | |
| Were the baselines stable? | X | | |
| Were any electronegative displacement (negative peaks) or unusual peaks detected? | | X | |
| **Field Duplicates** | | | |
| Where field duplicates submitted with the samples? | | X | |

## Pesticide/PBB Qualifier Summary
## Holding Time and Surrogates

| Sample ID | Holding Time | Surrogates - Column 1 | | Surrogates - Column 2 | |
|---|---|---|---|---|---|
| | | TCX | DCB | TCX | DCB |
| K40001F | OK for all samples | OK | | OK | |
| K40002F | | | | | |
| K40003F | | | | | |
| K40004F | | | | | |
| K40005F | | | | | |
| K40006F | | | | | |
| K40007F | | | | | |
| K40008F | | | | | |
| K40009F | | | | | |
| K40010F | | | | | |
| K40011F | | | | | |
| K40011FMS | | | | | |
| K40011FMSD | | | | | |
| K40034F | | | | | |
| K40034FDL | | | ↓ (55) | | ↓ (56) |
| K40035F | | | | | |
| K40036F | | | | | |
| K40037F | | | | | |
| K40038F | | | | | |
| K40039F | | | | | |
| K40040F | | | | | |
| K40041F | | | | | |
| K40042F | | | | | |

Surrogates:
TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:
D Surrogate diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

# Pesticide/PBB Calibration Summary

Instrument: HP2404
Column: RTX-5

| Date: | 4/26/94 | 4/27 | 4/27 | 4/27 | 4/28 | 4/28 | 4/28 |
|---|---|---|---|---|---|---|---|
| Time: | 20:30 | 06:37 | 14:57 | 23:17 | 07:38 | 15:57 | 21:55 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | ok | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |

Affected Samples:

# Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404
Column: RTX-5

| Date: | | 4/29 | 4/30 | 4/30 | 4/30 | 5/1 | 5/1 |
|---|---|---|---|---|---|---|---|
| Time: | | 18:05 | 02:24 | 10:51 | 19:58 | 04:16 | 13:13 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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## Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404
Column: RTX-5

| Data: | | 5/1 | 5/2 | 5/2 | 5/3 | 5/3 | 5/3 |
|---|---|---|---|---|---|---|---|
| Time: | | 21:34 | 09:56 | 16:15 | 02:37 | 10:57 | 19:18 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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## Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404
Column: RTX-5

| Date: | | 5/4 | 5/4 | | | | |
|---|---|---|---|---|---|---|---|
| Time: | | 03:39 | 11:59 | | | | |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | | ok | ok | | | | |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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# Pesticide/PBB Calibration Summary - Page 5

Instrument: HP2404
Column: RTX-35

| Date: | 4/26/94 | 4/27 | 4/27 | 4/27 | 4/28 | 4/28 | 4/28 |
|---|---|---|---|---|---|---|---|
| Time: | 20:30 | 06:37 | 14:57 | 23:17 | 07:38 | 15:57 | 21:55 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | ok | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| *gamma-Chlordane* | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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# Pesticide/PBB Calibration Summary - Page 6

Instrument: HP2404
Column: RTX-35

| Date: | | 4/29 | 4/30 | 4/30 | 4/30 | 5/1 | 5/1 |
|---|---|---|---|---|---|---|---|
| Time: | | 18:05 | 02:24 | 10:51 | 19:56 | 04:16 | 13:13 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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## Pesticide/PBB Calibration Summary - Page 7

Instrument: HP2404
Column: RTX-35

| Date: | | 5/1 | 5/2 | 5/2 | 5/3 | 5/3 | 5/3 |
|---|---|---|---|---|---|---|---|
| Time: | | 21:34 | 09:58 | 18:18 | 02:37 | 10:57 | 19:18 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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# Pesticide/PBB Calibration Summary - Page 8

Instrument: HP2404
Column: RTX-35

| Date: | | 5/4 | 5/4 | | | | |
|---|---|---|---|---|---|---|---|
| Time: | | 03:39 | 11:59 | | | | |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | | ok | ok | | | | |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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# Pesticide/PBB Calibration Summary - Page 9

Instrument: HP2404
Column: RTX-5

| Date: | 5/6/94 | 5/7 | 5/7 | 5/7 | 5/8 | 5/8 | 5/8 |
|---|---|---|---|---|---|---|---|
| Time: | 17:21 | 04:04 | 12:24 | 20:43 | 05:03 | 13:24 | 21:45 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | ok | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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## Pesticide/PBB Calibration Summary - Page 10

Instrument: HP2404
Column: RTX-5

| Date: | | 5/9 | 5/9 | 5/9 | 5/10 | 5/10 | 5/11 |
|---|---|---|---|---|---|---|---|
| Time: | | 06:05 | 14:25 | 22:45 | 07:05 | 15:25 | 01:09 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |
| Affected Samples: | | | | | | | |
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Instrument: HP2404
Column: RTX-35

| Date: | 5/6/94 | 5/7 | 5/7 | 5/7 | 5/8 | 5/8 | 5/8 |
|---|---|---|---|---|---|---|---|
| Time: | 17:21 | 04:04 | 12:24 | 20:43 | 05:03 | 13:24 | 21:45 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | ok | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| *trans-Nonachlor* | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |

Affected Samples:

# Pesticide/PBB Calibration Summary - Page 12

Instrument: HP2404
Column: RTX-35

| Date: | | 5/9 | 5/9 | 5/9 | 5/10 | 5/10 | 5/11 |
|---|---|---|---|---|---|---|---|
| Time: | | 06:05 | 14:25 | 22:45 | 07:05 | 15:25 | 01:09 |
| | Initial Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. | Cont. Cal. |
| | %RSD | %D | %D | %D | %D | %D | %D |
| 2-Bromobiphenyl | | ok | ok | ok | ok | ok | ok |
| 3-Bromobiphenyl | | | | | | | |
| 4-Bromobiphenyl | | | | | | | |
| Hexachlorobenzene | | | | | | | |
| gamma-BHC (Lindane) | | | | | | | |
| Aldrin | | | | | | | |
| Heptaclor epoxide | | | | | | | |
| gamma-Chlordane | | | | | | | |
| alpha-Chlordane | | | | | | | |
| trans-Nonachlor | | | | | | | |
| 4,4'-DDE | | | | | | | |
| Dieldrin | | | | | | | |
| 4,4'-DDD | | | | | | | |
| cis-Nonachlor | | | | | | | |
| 4,4'-DDT | | | | | | | |
| Hexabromobiphenyl (BP-6) | | | | | | | |
| Toxaphene | | | | | | | |
| Tetrachloro-m-xylene | | | | | | | |
| Decachlorobiphenyl | | | | | | | |

Affected Samples:

Corrected Sample Analysis Data Sheets

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40001F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208251
Phase Type: Biota
Date Received: 08/26/93
Phase Weight: 10.0 g
Date Extracted: 03/26/94
Extraction: Soxhlet
Date Analyzed: 04/30/94
Dilution Factor: 1.0
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0055 | JN |
| 5103-71-9 | alpha-Chlordane | 0.0051 | |
| ~~39765-80-5~~ | ~~trans-Nonachlor~~ | ~~0.0089~~ | R |
| 72-55-9 | 4,4'-DDE | 0.071 | |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.030 | |
| 5103-73-1 | cis-Nonachlor | 0.013 | |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| | | | Client ID No. |
| Lab Name: | Aquatec, Inc. | | K40002F |
| Lab Code: | AQUAI | | |
| Contract: | 91082 | | |
| Case: | BIO | SDG: | 39023 |
| | | Lab Sample Id: | 208253 |
| Phase Type: | Biota | Date Received: | 08/26/93 |
| Phase Weight: | 10.0 g | Date Extracted: | 03/26/94 |
| Extraction: | Soxhlet | Date Analyzed: | 04/30/94 |
| Dilution Factor: | 1.0 | Sulfur Clean-up: | N |

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.031 | |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.010 | U |
| 5103-73-1 | cis-Nonachlor | 0.0050 | U |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40003F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208255
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0
Date Received: 08/26/93
Date Extracted: 03/26/94
Date Analyzed: 04/30/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.025 | |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.010 | U |
| 5103-73-1 | cis-Nonachlor | 0.0050 | U |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40004F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208257
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0
Date Received: 08/26/93
Date Extracted: 03/26/94
Date Analyzed: 04/30/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.021 | |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.010 | U |
| 5103-73-1 | cis-Nonachlor | 0.0050 | U |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40005F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208259
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0
Date Received: 08/26/93
Date Extracted: 03/26/94
Date Analyzed: 04/30/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.030 | |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.010 | U |
| 5103-73-1 | cis-Nonachlor | 0.0050 | U |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

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# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40006F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208261
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0
Date Received: 08/26/93
Date Extracted: 03/26/94
Date Analyzed: 04/30/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.014 | J |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.010 | U |
| 5103-73-1 | cis-Nonachlor | 0.0050 | U |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40007F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208263
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0
Date Received: 08/26/93
Date Extracted: 03/26/94
Date Analyzed: 04/30/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.018 | |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.010 | U |
| 5103-73-1 | cis-Nonachlor | 0.0050 | U |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40008F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208265
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0
Date Received: 08/26/93
Date Extracted: 03/26/94
Date Analyzed: 04/30/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0058 | JN |
| 72-55-9 | 4,4'-DDE | 0.056 | |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.018 | |
| 5103-73-1 | cis-Nonachlor | 0.010 | |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Lab Name: | Aquatec, Inc. | Client ID No. | K40009F |
| Lab Code: | AQUAI | | |
| Contract: | 91082 | | |
| Case: | BIO | SDG: | 39023 |
| | | Lab Sample Id: | 208267 |
| Phase Type: | Biota | Date Received: | 08/26/93 |
| Phase Weight: | 10.0 g | Date Extracted: | 03/26/94 |
| Extraction: | Soxhlet | Date Analyzed: | 04/30/94 |
| Dilution Factor: | 1.0 | Sulfur Clean-up: | N |

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q | |
|---|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U | |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U | |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U | |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U | |
| 58-89-9 | gamma-BHC | 0.0050 | U | |
| 309-00-2 | Aldrin | 0.012 | J | |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U | |
| 5103-74-2 | gamma-Chlordane | 0.012 | JN | |
| 5103-71-9 | alpha-Chlordane | 0.012 | | |
| ~~39765-80-5~~ | ~~trans-Nonachlor~~ | ~~0.017~~ | | R |
| 72-55-9 | 4,4'-DDE | 0.12 | | |
| ~~60-57-1~~ | ~~Dieldrin~~ | ~~0.012~~ | | R |
| 72-54-8 | 4,4'-DDD | 0.067 | | |
| 5103-73-1 | cis-Nonachlor | 0.021 | | |
| 50-29-3 | 4,4'-DDT | 0.010 | U | |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U | |
| 8001-35-2 | Toxaphene | 0.20 | U | |

# PESTICIDE, PBB ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Lab Name: | Aquatec, Inc. | | Client ID No. |
| Lab Code: | AQUAI | | K40010F |
| Contract: | 91082 | | |
| Case: | BIO | SDG: | 39023 |
| | | Lab Sample Id: | 208269 |
| Phase Type: | Biota | Date Received: | 08/26/93 |
| Phase Weight: | 10.0 g | Date Extracted: | 03/26/94 |
| Extraction: | Soxhlet | Date Analyzed: | 04/30/94 |
| Dilution Factor: | 1.0 | Sulfur Clean-up: | N |

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.010 | U |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.010 | U |
| 5103-73-1 | cis-Nonachlor | 0.0050 | U |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40011F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208271
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0
Date Received: 08/26/93
Date Extracted: 03/26/94
Date Analyzed: 04/30/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| 309-00-2 | Aldrin | 0.0050 | U |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.0050 | U |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.010 | U |
| 60-57-1 | Dieldrin | 0.010 | U |
| 72-54-8 | 4,4'-DDD | 0.010 | U |
| 5103-73-1 | cis-Nonachlor | 0.0050 | U |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Lab Name: | Aquatec, Inc. | Client ID No. | K40034F |
| Lab Code: | AQUAI | | |
| Contract: | 91082 | | |
| Case: | BIO | SDG: | 39023 |
| | | Lab Sample Id: | 208276 |
| Phase Type: | Biota | Date Received: | 08/28/93 |
| Phase Weight: | 10.0 g | Date Extracted: | 03/29/94 |
| Extraction: | Soxhlet | Date Analyzed: | 05/01/94 |
| Dilution Factor: | 1.0 | Sulfur Clean-up: | N |

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0061 | J |
| 309-00-2 | Aldrin | 0.020 | JN |
| 1024-57-3 | Heptachlor Epoxide | 0.016 | |
| 5103-74-2 | gamma-Chlordane | 0.030 | JN |
| 5103-71-9 | alpha-Chlordane | 0.011 | J |
| ~~39765-80-5~~ | ~~trans-Nonachlor~~ | ~~0.024~~ | R |
| 72-55-9 | 4,4'-DDE | 0.18 ~~0.27~~ | X DJ |
| ~~60-57-1~~ | ~~Dieldrin~~ | ~~0.030~~ | R |
| 72-54-8 | 4,4'-DDD | 0.058 | |
| 5103-73-1 | cis-Nonachlor | 0.047 | JN |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.02 | U |
| 8001-35-2 | Toxaphene | 0.2 | U |

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# PESTICIDE, PBB ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| | | | Client ID No. |
| Lab Name: | Aquatec, Inc. | | K40035F |
| Lab Code: | AQUAI | | |
| Contract: | 91082 | | |
| Case: | BIO | SDG: | 39023 |
| | | Lab Sample Id: | 208278 |
| Phase Type: | Biota | Date Received: | 08/28/93 |
| Phase Weight: | 10.0 g | Date Extracted: | 03/29/94 |
| Extraction: | Soxhlet | Date Analyzed: | 05/01/94 |
| Dilution Factor: | 1.0 | Sulfur Clean-up: | N |

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q | |
|---|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U | |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U | |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U | |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U | |
| 58-89-9 | gamma-BHC | 0.0050 | U | |
| 309-00-2 | Aldrin | 0.011 | JN | |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U | |
| ~~5103-74-2~~ | ~~gamma-Chlordane~~ | ~~0.0066~~ | | R |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U | |
| ~~39765-80-5~~ | ~~trans-Nonachlor~~ | ~~0.0050~~ | | R |
| 72-55-9 | 4,4'-DDE | 0.053 | | |
| 60-57-1 | Dieldrin | 0.010 | U | |
| 72-54-8 | 4,4'-DDD | 0.012 | | |
| 5103-73-1 | cis-Nonachlor | 0.014 | J | |
| 50-29-3 | 4,4'-DDT | 0.010 | U | |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U | |
| 8001-35-2 | Toxaphene | 0.20 | U | |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40036F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208280
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 3.0
Date Received: 08/28/93
Date Extracted: 03/29/94
Date Analyzed: 05/08/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q | |
|---|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.030 | U | |
| 2113-57-7 | 3-Bromobiphenyl | 0.030 | U | |
| 92-66-0 | 4-Bromobiphenyl | 0.030 | U | |
| 118-74-1 | Hexachlorobenzene | 0.015 | U | |
| 58-89-9 | gamma-BHC | 0.015 | U | |
| 309-00-2 | Aldrin | 0.042 | JN | |
| 1024-57-3 | Heptachlor Epoxide | 0.026 | | |
| 5103-74-2 | gamma-Chlordane | 0.015 | U | |
| 5103-71-9 | alpha-Chlordane | 0.019 | | |
| 39765-80-5 | trans-Nonachlor | 0.015 | U | |
| 72-55-9 | 4,4'-DDE | 0.36 | | |
| ~~60-57-1~~ | ~~Dieldrin~~ | ~~0.042~~ | | R |
| 72-54-8 | 4,4'-DDD | 0.090 | | |
| 5103-73-1 | cis-Nonachlor | 0.091 | | |
| ~~50-29-3~~ | ~~4,4'-DDT~~ | ~~0.071~~ | | R |
| 36355-01-8 | Hexabromobiphenyl | 0.060 | U | |
| 8001-35-2 | Toxaphene | 0.60 | U | |

# PESTICIDE, PBB ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Lab Name: | Aquatec, Inc. | | Client ID No. |
| Lab Code: | AQUAI | | K40037F |
| Contract: | 91082 | | |
| Case: | BIO | SDG: | 39023 |
| | | Lab Sample Id: | 208282 |
| Phase Type: | Biota | Date Received: | 08/28/93 |
| Phase Weight: | 10.0 g | Date Extracted: | 03/29/94 |
| Extraction: | Soxhlet | Date Analyzed: | 05/08/94 |
| Dilution Factor: | 2.0 | Sulfur Clean-up: | N |

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q | |
|---|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.020 | U | |
| 2113-57-7 | 3-Bromobiphenyl | 0.020 | U | |
| 92-66-0 | 4-Bromobiphenyl | 0.020 | U | |
| 118-74-1 | Hexachlorobenzene | 0.010 | U | |
| 58-89-9 | gamma-BHC | 0.010 | U | |
| 309-00-2 | Aldrin | 0.022 | | JN |
| 1024-57-3 | Heptachlor Epoxide | 0.020 | | JN |
| 5103-74-2 | gamma-Chlordane | 0.019 | | JN |
| 5103-71-9 | alpha-Chlordane | 0.011 | | |
| 39765-80-5 | trans-Nonachlor | 0.010 | U | |
| 72-55-9 | 4,4'-DDE | 0.22 | | |
| 60-57-1 | Dieldrin | 0.020 | U | |
| 72-54-8 | 4,4'-DDD | 0.054 | | |
| 5103-73-1 | cis-Nonachlor | 0.034 | | |
| ~~50-29-3~~ | ~~4,4'-DDT~~ | ~~0.027~~ | | R |
| 36355-01-8 | Hexabromobiphenyl | 0.040 | U | |
| 8001-35-2 | Toxaphene | 0.40 | U | |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40038F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208284
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 2.0
Date Received: 08/28/93
Date Extracted: 03/29/94
Date Analyzed: 05/08/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q | |
|---|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.020 | U | |
| 2113-57-7 | 3-Bromobiphenyl | 0.020 | U | |
| 92-66-0 | 4-Bromobiphenyl | 0.020 | U | |
| 118-74-1 | Hexachlorobenzene | 0.010 | U | |
| 58-89-9 | gamma-BHC | 0.010 | U | |
| 309-00-2 | Aldrin | 0.015 | JN | |
| 1024-57-3 | Heptachlor Epoxide | 0.010 | U | |
| ~~5103-74-2~~ | ~~gamma-Chlordane~~ | ~~0.014~~ | | R |
| 5103-71-9 | alpha-Chlordane | 0.010 | U | |
| 39765-80-5 | trans-Nonachlor | 0.010 | U | |
| 72-55-9 | 4,4'-DDE | 0.19 | J | |
| 60-57-1 | Dieldrin | 0.020 | U | |
| 72-54-8 | 4,4'-DDD | 0.033 | | |
| 5103-73-1 | cis-Nonachlor | 0.043 | | |
| ~~50-29-3~~ | ~~4,4'-DDT~~ | ~~0.037~~ | | R |
| 36355-01-8 | Hexabromobiphenyl | 0.040 | U | |
| 8001-35-2 | Toxaphene | 0.40 | U | |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40039F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208286
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 2.0
Date Received: 08/28/93
Date Extracted: 03/29/94
Date Analyzed: 05/08/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.020 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.020 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.020 | U |
| 118-74-1 | Hexachlorobenzene | 0.010 | U |
| 58-89-9 | gamma-BHC | 0.010 | U |
| 309-00-2 | Aldrin | 0.032 | J |
| 1024-57-3 | Heptachlor Epoxide | 0.022 | J |
| 5103-74-2 | gamma-Chlordane | 0.037 | JN |
| 5103-71-9 | alpha-Chlordane | 0.019 | |
| ~~39765-80-5~~ | ~~trans-Nonachlor~~ | ~~0.033~~ | R |
| 72-55-9 | 4,4'-DDE | 0.29 | |
| ~~60-57-1~~ | ~~Dieldrin~~ | ~~0.035~~ | R |
| 72-54-8 | 4,4'-DDD | 0.085 | |
| 5103-73-1 | cis-Nonachlor | 0.077 | |
| ~~50-29-3~~ | ~~4,4'-DDT~~ | ~~0.056~~ | R |
| 36355-01-8 | Hexabromobiphenyl | 0.040 | U |
| 8001-35-2 | Toxaphene | 0.40 | U |

# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40040F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208288
Phase Type: Biota
Date Received: 08/28/93
Phase Weight: 10.0 g
Date Extracted: 03/29/94
Extraction: Soxhlet
Date Analyzed: 05/01/94
Dilution Factor: 1.0
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q |
|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U |
| 58-89-9 | gamma-BHC | 0.0050 | U |
| ~~309-00-2~~ | ~~Aldrin~~ | ~~0.012~~ | R |
| 1024-57-3 | Heptachlor Epoxide | 0.0050 | U |
| 5103-74-2 | gamma-Chlordane | 0.016 | JN |
| 5103-71-9 | alpha-Chlordane | 0.0050 | U |
| 39765-80-5 | trans-Nonachlor | 0.0050 | U |
| 72-55-9 | 4,4'-DDE | 0.15 | |
| 60-57-1 | Dieldrin | 0.030 | JN |
| 72-54-8 | 4,4'-DDD | 0.026 | |
| 5103-73-1 | cis-Nonachlor | 0.032 | |
| 50-29-3 | 4,4'-DDT | 0.010 | U |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U |
| 8001-35-2 | Toxaphene | 0.20 | U |

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# PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.: K40041F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO
SDG: 39023

Lab Sample Id: 208290
Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 2.0
Date Received: 08/28/93
Date Extracted: 03/29/94
Date Analyzed: 05/08/94
Sulfur Clean-up: N

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q | |
|---|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.020 | U | |
| 2113-57-7 | 3-Bromobiphenyl | 0.020 | U | |
| 92-66-0 | 4-Bromobiphenyl | 0.020 | U | |
| 118-74-1 | Hexachlorobenzene | 0.010 | U | |
| 58-89-9 | gamma-BHC | 0.010 | U | |
| 309-00-2 | Aldrin | 0.040 | J | |
| 1024-57-3 | Heptachlor Epoxide | 0.037 | | |
| 5103-74-2 | gamma-Chlordane | 0.029 | JN | |
| 5103-71-9 | alpha-Chlordane | 0.022 | | |
| ~~39765-80-5~~ | ~~trans-Nonachlor~~ | ~~0.026~~ | | R |
| 72-55-9 | 4,4'-DDE | 0.21 | | |
| ~~60-57-1~~ | ~~Dieldrin~~ | ~~0.024~~ | | R |
| 72-54-8 | 4,4'-DDD | 0.086 | | |
| 5103-73-1 | cis-Nonachlor | 0.037 | | |
| 50-29-3 | 4,4'-DDT | 0.020 | U | |
| 36355-01-8 | Hexabromobiphenyl | 0.040 | U | |
| 8001-35-2 | Toxaphene | 0.40 | U | |

1

# PESTICIDE, PBB ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| | | | Client ID No. |
| Lab Name: | Aquatec, Inc. | | K40042F |
| Lab Code: | AQUAI | | |
| Contract: | 91082 | | |
| Case: | BIO | SDG: | 39023 |
| | | Lab Sample Id: | 208292 |
| Phase Type: | Biota | Date Received: | 08/28/94 |
| Phase Weight: | 10.0 g | Date Extracted: | 03/31/94 |
| Extraction: | Soxhlet | Date Analyzed: | 05/01/94 |
| Dilution Factor: | 1.0 | Sulfur Clean-up: | N |

| CAS NO. | COMPOUND | CONCENTRATION (mg/Kg) | Q | |
|---|---|---|---|---|
| 2052-07-5 | 2-Bromobiphenyl | 0.010 | U | |
| 2113-57-7 | 3-Bromobiphenyl | 0.010 | U | |
| 92-66-0 | 4-Bromobiphenyl | 0.010 | U | |
| 118-74-1 | Hexachlorobenzene | 0.0050 | U | |
| 58-89-9 | gamma-BHC | 0.0050 | U | |
| 309-00-2 | Aldrin | 0.019 | J | |
| 1024-57-3 | Heptachlor Epoxide | 0.023 | | |
| 5103-74-2 | gamma-Chlordane | 0.018 | JN | |
| 5103-71-9 | alpha-Chlordane | 0.014 | | |
| ~~39765-80-5~~ | ~~trans-Nonachlor~~ | ~~0.010~~ | | R |
| 72-55-9 | 4,4'-DDE | 0.14 | J | |
| ~~60-57-1~~ | ~~Dieldrin~~ | ~~0.021~~ | | R |
| 72-54-8 | 4,4'-DDD | 0.043 | | |
| 5103-73-1 | cis-Nonachlor | 0.031 | | |
| ~~50-29-3~~ | ~~4,4'-DDT~~ | ~~0.026~~ | | R |
| 36355-01-8 | Hexabromobiphenyl | 0.020 | U | |
| 8001-35-2 | Toxaphene | 0.20 | U | |

# MERCURY ANALYSES

## Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.

B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

E The reported value is estimated due to the presence of interference.

M Duplicate injection precision not met.

N Spiked sample recovery not within control limits.

S Reported value was determined by the method of standard additions (MSA).

W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.

* Duplicate analysis not within control limits.

\+ Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.

R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, *even if it has passed all QC test, is guaranteed to be accurate.* Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., calibration and preparation blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

# Data Validation Checksheets

## Inorganic Data Validation Checklist

| | YES | NO | NA |
|---|---|---|---|
| **Data Completeness and Deliverables** | | | |
| Is there a narrative or cover letter present? | X | | |
| Are the sample numbers included in the narrative? | X | | |
| Are the sample chain-of-custodies present? | X | | |
| Do the chain-of-custodies indicate any problems with sample receipt or sample condition? | | X | |
| Form I to IX | | | |
| Are all the Form I through Form IX labeled with: | | | |
| Laboratory name? | X | | |
| Sample No.? | X | | |
| SDG No.? | X | | |
| Correct units? | X | | |
| Matrix? | X | | |
| Raw Data | | | |
| Is the digestion log for flame AA/ICP present? | | | X |
| Is the digestion log for furnace AA present? | | | X |
| Is the distillation log for mercury present? | X | | |
| Is the distillation log for cyanides present? | | | X |
| Are preparation dates present on sample preparation logs/bench sheets? | X | | |
| Are the measurement read out records present for: | | | |
| ICP | | | X |
| Flame AA | | | X |
| Furnace AA | | | X |
| Mercury | X | | |
| Cyanides | | | X |
| Is the data legible? | X | | |
| Is the data properly labeled? | X | | |
| **Holding Times** | | | |
| Were mercury analyses performed within 28 days? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Were cyanide distillations performed within 14 days? | | | X |
| Were other metal analysis performed within 6 months? | | | X |
| Form I (Final Data) | | | |
| Are all *forms complete*? | X | | |
| Are correct units indicated on Form I's? | X | | |
| Are all "less than IDL" values properly coded with "U"? | X | | |
| Are the correct concentration qualifiers used with final data? | X | | |
| Was a brief physical description of samples given on Form I's? | | X | |
| **Calibration** | | | |
| Is a record of at least 2 point calibration present for ICP analysis? | | | X |
| Is a record of 5 point calibration present for Hg analysis? | X | | |
| Is a record of 4 point calibration present for: | | | |
| Flame AA? | | | X |
| Furnace AA? | | | X |
| Cyanides? | | | X |
| Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses? | | | X |
| Is correlation coefficient less than .995 for: | | | |
| Mercury Analysis? | X | | |
| Cyanide Analysis? | | | X |
| Atomic Absorption Analysis? | | | X |
| **Form II A (Initial and Continuing Calibration Verification)** | | | |
| Present and complete for every metal and cyanide? | X | | |
| Are all calibration standards (initial and continuing) within control limits for: | | | |
| Metals (90-110 %R)? | | | X |
| Hg (80-120 %R)? | X | | |
| Cyanides (85-115 %R)? | | | X |

| | YES | NO | NA |
|---|---|---|---|
| Was continuing calibration performed every 10 samples or every 2 hours? | X | | |
| Was the ICV for cyanides distilled? | | | X |
| Form II B (CRDL Standards for AA and ICP) | | | |
| Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)? | | | X |
| Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis? | | | X |
| Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run? | | | X |
| Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run? | | | X |
| Are CRA and CRI standards within control limits for metals (60-120 %R)? | X | | |
| Is mid-range standard within control limits for cyanide (80-120 %R) | | | X |
| **Form III (Initial and Continuing Calibration Blanks)** | | | |
| Present and complete? | X | | |
| Was an initial calibration blank analyzed? | X | | |
| Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)? | X | | |
| Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)? | X | | |
| Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)? | | | X |
| **Form III (Preparation Blank)** | | | |
| Was one prep. blank analyzed for: | | | |
| each Sample Delivery Group SDG)? | X | | |
| each batch of digested samples? | X | | |
| each matrix type? | X | | |
| Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL? | | X | |

| | YES | NO | NA |
|---|---|---|---|
| If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank? | | | X |
| Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL? | | | X |
| Is concentration of prep. blank below the negative CRDL? | | X | |
| **Form IV (ICP Interference Check Sample)** | | | |
| Present and complete? | | | X |
| Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)? | | | X |
| Are all Interference Check Sample results inside the control limits (±20%)? | | | X |
| If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS? | | | X |
| **Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)** | | | |
| Present and complete for: | | | |
| each SDG? | X | | |
| each matrix type? | X | | |
| Was field blank used for spiked sample? | | X | |
| Are all recoveries within control limits (75-125)? | X | | |
| If no, is sample concentration greater than or equal to four times spike concentration? | | | X |
| Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA? | | | X |
| Are any spike recoveries: | | | |
| less than 10%? | | X | |
| between 10-74%? | | X | |
| between 126-200%? | | X | |
| greater than 200%? | | X | |
| **Form VI (Lab Duplicates)** | | | |
| Present and complete for: | | | |
| each SDG? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| each matrix type? | X | | |
| Was field blank used for duplicate analysis? | | X | |
| Are all values within control limits (RPD 20% or difference ≤ ±CRDL)? | X | | |
| If no, are all results outside the control limits flagged with an * on Form I's and VI? | | | X |
| Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%? | | X | |
| Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL? | | | X |
| **Form VII (Laboratory Control Sample)** | | | |
| Was one LCS prepared and analyzed for: | | | |
| each SDG? | X | | |
| each batch samples digested/distilled? | X | | |
| Is LLCS "Found" value higher than the control limits on Form VII? | | X | |
| Is LCS "Found" lower than the control limits on Form VII? | | X | |
| **Form IX (ICP Serial Dilution)** | | | |
| Was Serial Dilution analysis performed for: | | | |
| each SDG? | | | X |
| each matrix type? | | | X |
| Was field blank(s) used for Serial Dilution Analysis? | | | X |
| Are results outside control limit flagged with an "E"" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater. | | | X |
| Are any % difference values: | | | |
| > 10%? | | | X |
| ≥100%? | | | X |
| **Furnace Atomic Absorbtion (AA) QC Analysis** | | | |
| Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed be GFAA? | | | X |

| | YES | NO | NA |
|---|---|---|---|
| Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL? | | | X |
| Was a dilution analyzed for sample with analytical spike recovery less than 40%? | | | X |
| Is analytical spike recovery outside the control limits (85-115%) for any sample? | | | X |
| **Form VIII (Method of Standard Addition Results)** | | | |
| Present? | | X | |
| If no, is any Form I result coded with "S" or a "+"? | | X | |
| Is coefficient of correlation for MSA less than 0.990 for any sample? | | | X |
| Was MSA required for any sample but not performed? | | X | |
| Is coefficient of correlation for MSA less than 0.995? | | | X |
| Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run? | | | X |
| Was proper quantitation procedure followed as outlined in the SOW on page E-23? | | | X |
| **Field Blank** | | | |
| Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples? | | | X |
| If no, was field blank value already rejected due to other QC criteria? | | | X |
| **Form X, XI, XII (Verification of Instrumental Parameters)** | | | |
| Is verification report present for : | | | |
| Instrument Detection Limits (quarterly)? | X | | |
| ICP Interelement Correlation Factors (annually)? | | | X |
| ICP Linear Ranges (quarterly)? | | | X |
| **Form X (Instrument Detection Limits)** | | | |
| Are IDLs present for: | | | |
| all the analytes? | X | | |
| all the instruments used? | X | | |

| | YES | NO | NA |
|---|---|---|---|
| Is IDL greater than CRDL for any analyte? | | X | |
| If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL. | | | X |
| Was any sample result higher linear range of ICP. | | | X |
| Was any sample result higher than the highest calibration standard for non-ICP parameters? | | X | |
| If yes for any of the above, was the sample diluted to obtain the result on Form I? | | | X |

Corrected Sample Analysis Data Sheets

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40001F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208251

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.05 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40002F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208253

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.10 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

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Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40003F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208255

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.05 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40004F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208257

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.10 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

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Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40005F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208259

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.08 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40006F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208261

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.05 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40007F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208263

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.08 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40008F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208265

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.06 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40009F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208267

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.05 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40010F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208269

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.06 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40011F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208271

Level (low/med): LOW Date Received: 08/26/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.12 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40034F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208276

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.08 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40035F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208278

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.14 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40036F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208280

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.10 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40037F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208282

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.03 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40038F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208284

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.12 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40039F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208286

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.06 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40040F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208288

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.10 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40041F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208290

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.04 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40042F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39023

Matrix (soil/water): SOIL Lab Sample ID: 208292

Level (low/med): LOW Date Received: 08/28/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-36-0 | Antimony | | | | NR |
| 7440-38-2 | Arsenic | | | | NR |
| 7440-39-3 | Barium | | | | NR |
| 7440-41-7 | Beryllium | | | | NR |
| 7440-43-9 | Cadmium | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7440-47-3 | Chromium | | | | NR |
| 7440-48-4 | Cobalt | | | | NR |
| 7440-50-8 | Copper | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-92-1 | Lead | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7439-97-6 | Mercury | 0.05 | | | CV |
| 7440-02-0 | Nickel | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-22-4 | Silver | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-28-0 | Thallium | | | | NR |
| 7440-62-2 | Vanadium | | | | NR |
| 7440-66-6 | Zinc | | | | NR |
| | Cyanide | | | | NR |
| | | | | | |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

# MISCELLANEOUS PARAMETERS

## MISCELLANEOUS PARAMETERS

| Sample ID | Description | Sex | Fillet Weight | % Lipids | |
|---|---|---|---|---|---|
| | | | | Fillet | Remaining Carcass |
| K40001 | Carp | female | 715g | 1.05 | 2.70 |
| K40002 | Carp | female | 847g | 0.95 | 2.40 |
| K40003 | Carp | female | 555g | 1.07 | 2.40 |
| K40004 | Carp | female | 420g | 0.40 | 0.68 |
| K40005 | Carp | female | 453g | 0.86 | 3.10 |
| K40006 | Carp | female | 498g | 0.67 | 1.50 |
| K40007 | Carp | female | 894g | 0.69 | 2.70 |
| K40008 | Carp | female | 1306g | 1.31 | 1.80 |
| K40009 | Carp | female | 974g | 4.24 | 9.50 |
| K40010 | Carp | female | 277g | 0.16 | 0.65 |
| K40011 | Carp | female | 245g | 0.22 | 0.61 |
| K40034 | Carp | male | 681g | 3.31 | 5.20 |
| K40035 | Carp | female | 737g | 0.89 | 1.90 |
| K40036 | Carp | female | 1240g | 3.26 | 6.00 |
| K40037 | Carp | female | 573g | 3.49 | 7.80 |
| K40038 | Carp | female | 743g | 1.89 | 1.40 |
| K40039 | Carp | female | 884g | 4.75 | 6.90 |
| K40040 | Carp | male | 469g | 1.73 | 4.30 |
| K40041 | Carp | female | 668g | 6.82 | 13.6 |
| K40042 | Carp | female | 543g | 7.40 | 8.70 |